# The Roman forts on the Bar Hill, Dumbartonshire

George MacDonald, Alexander Park

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# THE ROMAN FORTS ON THE BAR HILL

# THE ROMAN FORTS
ON
# THE BAR HILL
## DUMBARTONSHIRE

BY

Sir GEORGE MACDONALD, 1862- LL.D.

AND

ALEXANDER PARK, F.S.A.Scot.

*WITH A NOTE ON THE ARCHITECTURAL DETAILS BY*

THOMAS ROSS, F.S.A.Scot.

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# PREFATORY NOTE

THE excavations here dealt with were carried out during the years 1902-1905. The entire cost of the whole series of operations was defrayed by Mr. Whitelaw of Gartshore, on whose estate the forts are situated. Of the enlightened public spirit thus displayed it would be difficult to speak too warmly. The following report on the results was originally written for the *Proceedings* of the Society of Antiquaries of Scotland. Its publication in its present form is the outcome of a suggestion put before us while it was still in manuscript, and cordially approved by the Council of the Society. In view of the exceptional interest of the discoveries recorded, it seemed desirable that the story should be made accessible to as wide a circle of readers as possible.

If the task of collating the multifarious evidence has not been altogether easy, it has been materially lightened by the help we have received from many quarters. Various acknowledgments will be found in the footnotes. To these we would now add a special word of thanks to Mr. Thomas Ross and Dr. T. H. Bryce for their important contributions. And we should also like to say that we recall with particular pleasure the stimulus provided by Mr. Haverfield's repeated visits to the site while the work was in progress, as well as his kindness in reading through our proofs. Lastly, it ought to be mentioned that the plans and sections reproduced upon the Plates are the work of Messrs. Simpson and Wilson, C.E., Glasgow.

G. M.
A. P.

*November*, 1906.

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# THE ROMAN FORTS ON THE BAR HILL

## I. THE SITE AND ITS HISTORY.

Travellers by the Edinburgh and Glasgow Railway seldom fail to notice a small clump of hills that lies rather more than a mile to the north-west of Croy Station. The accompanying map (PLATE I.) reproduces its chief geographical features. The twin peak so conspicuous from the train belongs to what may be called the south-easterly spur of the range. This spur is in reality a whinstone ridge, easily ascended from east or west, but sloping sharply upwards from the southern side, and still more sharply downwards on its northern face. Its heights, which attain an elevation of 511 feet, are planted, and form part of what is known as the Bar Hill Wood. From the summit one looks northward, over a green basin of arable land, to a very similar, but much shorter and slightly lower, ridge which culminates in a single rocky peak usually called the Castle Hill (507 ft.). Towards the east the green basin is open. Its western side climbs gently until it loses itself on the steep shoulders of two flat-topped hills that constitute the main, though not the highest, portion of the whole group. These latter are separated from each other by a comparatively slight depression, and to each of them is attached one of the spurs or ridges already described. The narrower and more southerly of the flat-topped hills goes by the name of Creecy Hill (486 ft.). The more northerly we shall call the Bar Hill proper (495 ft.). It is with this last that we are here specially concerned. In the course of the operations with which we have to deal, its surface was found to consist of a thick layer of boulder clay. On the southern side of its highest part the clay rests on a bed of sand.

The situation of the range is remarkable. Rising as nearly as possible midway between sea and sea, it also contains the highest ground along the line of the isthmus. The view from the top of the Castle Hill—the most favourable point for the purpose—is very extensive. On the north, visible in its completeness from end to end, stretches the low valley that runs from Forth to Clyde. Across the intervening river Kelvin frown the Campsie Fells and their sister hills, forming an imposing natural bulwark to the "northern realms of ancient Caledon." Even the uninstructed feels instinctively that this would be a position of vital importance to any military force attempting to hold the isthmus from the south. As a matter of fact, when the spectator turns eastward, his attention is immediately arrested by the deep depression that still marks the course of the great Ditch dug by the Roman legions. His eye would find it easy to follow the line all the way from Croy Hill to the very spot where he is standing. Some thirty or forty yards beneath him, it sweeps along the northern face of the Castle Hill, hewn nine feet deep into the solid rock, and passes away to the west. Behind it are still discernible the traces of the companion Rampart.

A glance at the map will show how the conditions imposed by the configuration of the ground were met by the Roman engineers. Both Ditch and Rampart at this point of their course bend decidedly to the north, with the express object of enclosing the Castle Hill, a coign of vantage which it would not have been safe to leave outside. But the slopes of the hill itself were far too steep to afford secure foothold for the Military Way, which was thus compelled to keep some distance to the south. When the green basin already spoken of, generally styled the Castle Hill Park, is under cultivation, the line of the Roman road can even now be clearly made out, crossing it from east to west, and marked by a slight elevation of the surface. About half-way up the western side of the basin it divides into two, one section branching northwards so as to approach the Rampart once more, the other ascending directly towards the centre of the Bar Hill proper.

There is good reason to think that somewhere within this basin, under the shelter of the friendly hills, there may at one time have nestled a civil settlement or *annexe*, such as was the ordinary accompaniment of every permanent Roman military station. An indication to that effect was furnished during the progress of the recent excavations. And other signs have not been wanting. An altar dedicated to Silvanus was found here in 1895. Again, about the middle of its southern side there is an excellent spring of water, near which (according to the testimony of labourers still living) drainage operations have disclosed substantial remains of stone paving. However this may be,[1] it is certain that the Bar Hill proper was the site of a Roman fort. It is admirably adapted for the purpose. Its top consists of a wide and comparatively level expanse, but on every side except the south the descent is sufficiently steep to be a material aid in defence. To the north, more especially, the fall of the ground is rapid. An attacking party from that direction could only have got within striking distance after a continuous climb of nearly 300 feet. Finally, the discovery of a buried well showed that in the very centre of the plateau there had been in Roman times an abundant supply of water.

Two hundred years ago the remains of the buildings of the fort were still considerable. There is, indeed, no mention of them in the earliest 'archaeological survey' of Graham's Dyke, the well-known letter of 1697 preserved among the Portland Papers. The writer has much of interest to say concerning the eastern half of the Vallum and its forts. But when he reaches the neighbourhood of Bar Hill, he breaks off with tantalising abruptness. Kilsyth, he tells us, is

> a pretty good countrey town, but inferior to Fallkirk or Linlithgow; but this I say for it, there is better entertainment for man and horse and more reasonable than anywhere upon the road. . . . When I am at leasure I will give you the rest of this.[2]

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[1] The operations referred to were carried out in 1873, and the stones are said to have been carried away to be used as drain covers. Systematic search recently made for traces of the paving has been fruitless.

[2] *Hist. MSS. Commission, Portland Papers*, vol. ii. p. 57.

Ten years later (1707) Sir Robert Sibbald, using the materials collected by Timothy Pont, Irvine, and David Buchanan, wrote as follows:—

> From thence [Shirva Burn] a large mile to Barhill, where was a great Fort, which hath had large Entrenchments, the ruins of Buildings were traced there, and many Stones have been found there with Inscriptions, and some with Figures upon them, which are kept at the Houses of the Nobility and Gentry in the Neighbourhood, there is a fresh Spring there and a Fountain, and amongst the Rubbish of the Fort, there was found a large Iron Shovel of a vast weight, and divers Sepulchres covered with large Stones, were found there upon digging the Ground.[1]

Sibbald's mention of the "fresh Spring" and the "Fountain" is of interest. The latter is probably identical with the spring that still bubbles on the south side of the green basin. The former was in all likelihood the overflow from the buried well in the centre of the camp. If this surmise be correct, a further accumulation of debris on the surface must have almost completely choked the "Spring" soon after it was seen by Sibbald (or his authorities).[2] There is no reference to it in the *Itinerarium Septentrionale*, and yet it is just one of the things that could hardly have failed to catch the eye of 'Sandy' Gordon, had it still been visible. His description is as follows:—

> [At Bar Hill there] is to be seen a very large and well preserved Fort upon the Wall: Here the Foundations of Buildings appear very distinct within the Area; which is surrounded with a considerable Number of Ditches and Ramparts, particularly at the East and West Ends of this Fort. . . . There is no *Roman* Fort, which I know of in *Scotland*, where the Vestiges of the old Buildings appear so plain as here, seeing the *Prætorium*, where the Præfect's Tent stood, is as yet very discernible, together with the Lodgements of the other Officers. . . . The military Way along *Graham's Dike*, divides itself into two Branches here, the one running by the side of the great Ditch, the other comes up to the Ramparts of this Fort.[3]

As it stands, the statement regarding the division of the road might be interpreted as perfectly accurate. Gordon's actual plan,[4] however, is erroneous, and would appear to have been completed, not by the aid of observations on the spot, but by a literal interpretation of the text as printed, for the southern branch of the road, instead of soberly entering the fort by the eastern gate, is made to run full tilt against the ramparts.

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[1] *Historical Inquiries*, p. 29.

[2] The possible effects of mineral operations in the neighbourhood must also be reckoned with. It may be mentioned that the water of the well now rises to within $2\frac{1}{2}$ feet of the surface, at which level it stands.

[3] *Itin. Sept.*, pp. 54 f.

[4] *Op. cit.*, Plate 22.

Horsley, writing in 1732, was almost as much impressed by the remains as Gordon had been. He says:—

> Barhill fort deserves a particular regard and description. Its situation and strength, and the ruins of buildings within it are very remarkable. . . . It has a triple rampart and a ditch on all sides but the north. The *praetorium* is visible, and of a similar figure within the fort itself. And three rows of ruins resembling ramparts and ditches appear within the *praetorium*. . . . There is a branch goes off from the principal military way to the north entry of this fort, and goes out again at the east entry, and then passing round the south side of the southern summit, comes up again to the main way.[1]

There is an obvious confusion here regarding the road, and the rampart is single, not triple. But the "three rows of ruins" (well shown, by the way, in Gordon's plan) were rediscovered during the recent excavations, when their true significance was made apparent. Maitland (1757) offers no fresh contribution of importance to our knowledge. As usual, his main anxiety is to detect flaws in the statements of Gordon and Horsley. Their accounts of the road give him an opening of which he takes full advantage. Unluckily, after he has administered a severe castigation to his predecessors for their stumbling, he himself falls headlong over precisely the same obstacle. "After the strictest search," he denies that the Military Way ran on the north of the fort. He is positive that it went straight through.[2]

Roy, in his *Military Antiquities*, deals very briefly with the Bar Hill station.

> The fort, which is a little way detached from the south side of the wall, was probably one of those previously erected by Agricola. It is surrounded with double ramparts [and] contains many ruinous foundations within its area, whose vestiges, however, are not now so entire as represented in the Itinerarium.[3]

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[1] *Britannia Romana*, p. 169.

[2] *History of Scotland*, pp. 176 f.

[3] *Op. cit.*, p. 160.

Roy, it will be seen, has been misled by surface appearances; as has already been remarked, the rampart is a single one. In his plan, too, he goes wrong about the roads just as Maitland had done, for he makes the Military Way traverse the camp from east to west. Yet his reference is exceedingly interesting for two reasons. He was the first observer to draw attention to the peculiarity presented by this fort in being completely detached from the body of the Vallum, a feature the true significance of which his military instinct enabled him to divine. Again, from what he says we can gather that the latter part of the eighteenth century saw many inroads on the ruins. One of these destructive raids seems to have taken place about 1790. In the old *Statistical Account of Scotland*[1] (1791) the minister of Kirkintilloch, speaking of Bar Hill, says:—

> The fort is a square area of 150 yards. Some vaults belonging to it have lately been discovered. These are still entire; and are covered above with flat bricks, and floored with a mixture of lime and black and white gravel, resembling sand from the sea-shore, very unlike any that is now to be found in the neighbourhood.

During the early portion of the nineteenth century the process of quarrying went on apace. The site of the fort forms part of the estate of Gartshore, and in 1801 and 1802 the then proprietor carried out an extensive improvement scheme which was doubtless responsible for much. It may be to these changes that Stuart alludes when, writing in 1845, he tells us that

> Many of [the foundations] have only been recently removed, to supply materials for building, or to serve the purpose of enclosing the adjacent fields.[2]

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[1] Vol. ii. p. 276.

[2] *Caledonia Romana* (first ed.), p. 331. In the second edition, p. 338, a footnote (from another hand than Stuart's) gives a remarkable story of destruction said to have been wrought in 1809, when "stone walls" were "demolished" and "massive foundations rooted out." The accuracy of this whole statement is open to serious doubt. It is asserted, for instance, that the fort was "surrounded by a thick stone wall forming a great square." Mr Whitelaw's excavations proved conclusively that this was not the case. The original narrator may have been confusing Bar Hill with Castlecary.

In 1892 the remains attracted the notice of the Glasgow Archaeological Society's Committee, then engaged on an examination of the structure of the Antonine Vallum. In their published *Report* they say:—

> The outline of the station can still be made out in the field—the indent of the ditch all round being readily traceable, as well as the rounded corners of the enclosure.[1]

It might have been added that beneath the field hedge on the south the kerb of the southern rampart peeped out here and there above the grass. Even so, the picture presents a melancholy contrast to that drawn a century and a half before by Gordon. A few years longer, and the very site would perhaps have been forgotten. Fortunately, it was not to be so.

## II. MR WHITELAW'S EXCAVATIONS.

An entirely fresh chapter in the history of the fort was opened in 1902. In the preface to the *Report* already quoted, cordial acknowledgment is made of the liberality with which Mr Alexander Whitelaw of Gartshore had placed at the service of the Glasgow Committee the labour necessary for cutting the numerous sections of Rampart and Ditch made at Croy and at Bar Hill. If his generosity deserved warm recognition then, Mr Whitelaw has now laid under a much deeper obligation all who are in any way interested in the story of Roman Britain. With a public spirit that is beyond praise, he has had the camp and its surroundings systematically explored at his own expense, keeping in close personal touch with the work throughout, and letting it be clearly understood that excavation was to proceed until there was nothing more to be discovered. It is but fair to add that the success achieved is due in no small measure to the enthusiasm, care, and well-reasoned perception of Mr John M'Intosh, the forester on the Gartshore Estate, to whom was entrusted the duty of immediate supervision. Mr M'Intosh has also rendered valuable aid in the preparation of the present Report.

Operations were commenced on November 20th, 1902. Attention was first directed to those points where the surface indications were at all abnormal. The field had been under corn, and several patches showed stubble of unusually vigorous growth. An hour or two sufficed to dispose of these. On their being 'pitted,' the evidence was such as to suggest that, at some time or other, at least some of them had been fireplaces. Underneath each was a layer of wood ashes, from 1 to 2 feet thick, with a large stone in the centre. The spot next chosen for attack lay almost exactly in the middle of the fort. It had long been remarkable for its peculiar greenness in spring and early summer. The sloping ground immediately to the south of it, too, was frequently damp. Digging soon revealed the cause of these phenomena. Less than a foot beneath the surface the workmen struck the kerb of an old well.

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[1] *The Antonine Wall, etc.*, p. 94.

Such a discovery on the very first morning was a piece of rare good fortune, and it was followed up without delay. In the face of considerable difficulties, the well (which had plainly been filled up of set purpose) was entirely cleared out. The upper stratum was disappointing. It consisted wholly of building material—pieces of freestone of various sizes, sometimes dressed, but generally quite rough—piled in hopeless confusion. At a depth of 12 feet there came to light the capital of a column, the precursor of much that was interesting. On November 22nd the workmen were 17 feet down, and had recovered five capitals and bases of pillars, 15½ linear feet of round columns, and one fragment of an inscribed tablet. At this juncture it became necessary to erect overhead gear. In view of the great weight of the stones and the consequent danger of serious accident, it was deemed advisable to employ two winches, one to let down and pull up the man who attached the tackle for haulage, the other to bring to the surface the columns, bases, and capitals that now formed an almost solid mass, the larger pieces usually jammed hard against the stone 'cradling' of the well. With a total diameter of not more than 4 feet, the space conditions were extremely trying. The water also proved very troublesome, rising with steadily increasing rapidity. To keep it under, a running gear with two buckets had to be constantly in motion.

All obstacles were, however, overcome; and the deeper the workmen descended, the keener grew the interest. On November 24th a second and third fragment of the inscribed tablet reached the surface, as well as more portions of pillars and a few pieces of oak. On Monday the 26th, besides further portions of pillars, the spoils included an inscribed altar (found 33 feet down), the horn of a red deer, a single coin (which was resting on the edge of one of the 'cradling' stones), a number of bits of squared oak, the frame and pulley wheel that had belonged to the original overhead gearing, and many pieces of iron. On the 27th, at 38 feet, there was found a broken amphora of great size, with a bag of what looked like tools inside the largest fragment, as well as a miscellaneous collection of objects of iron. Bottom was finally touched at 43 feet. Immediately above, a stratum of mud and small stones, 2½ feet in thickness, had been encountered. The whole of the material of which it was composed was carefully washed through riddles, with the result that a number of coins and other small objects were recovered. The foundations of the 'cradling' were then strengthened with cement, the bottom filled in with concrete, and the well allowed to fill with water. Fig. 1 is a view taken after all was over. In the background are shown some of the building-stones that had been used to fill the uppermost portion.

An inventory of the contents of this wonderful cache will be given below. Its exploration provided a powerful incentive to further investigation of the site, and the subsequent operations, though fruitful in many ways, furnished no episode nearly so exciting. The work proceeded—more or less intermittently, according to the season—until the summer of 1905. During the first few months of its course the excavators were much hampered by wet weather, and particularly by a succession of heavy rainstorms, which interrupted the digging, caused the excavations in many cases to fall in,[1] and interfered seriously with accurate observation. A detailed narrative of events is, however, hardly called for. It will be at once simpler and clearer to summarise and illustrate under appropriate headings the more important of the results obtained. From a historical point of view, the most interesting of these was the confirma-

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[1] It was specially unfortunate that much damage was done before photographs were secured. But for this, the illustrations in the present Report would have been a good deal more effective.

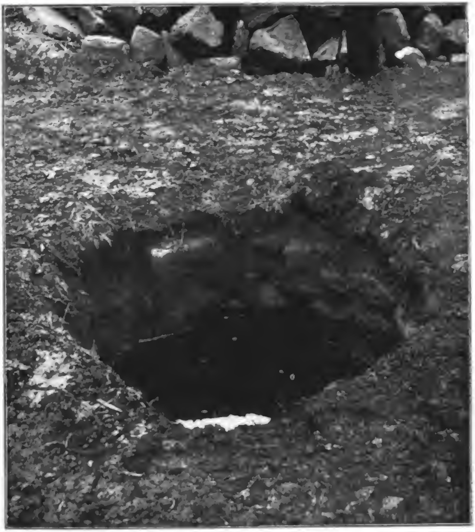

Fig. 1. The Well.

tion of Roy's conjecture that the Bar Hill had originally been fortified under the orders of Agricola. It will be convenient to deal first with the evidence for this older occupation.

## III. The Early Fort.

Of the early fort no trace whatever remained above the surface. Its discovery was accidental. During a search for buildings within the ramparts of the later enclosure, the workmen had occasion to cut a series of parallel trenches N. and S. Quite unexpectedly these revealed a large ditch about 9 feet wide by 4½ feet deep, and of the V-shaped type so frequently associated with Roman military engineering. On further examination, this ditch proved to be part of a connected system. When the whole had been opened up, there finally emerged the outline shown in red upon the Plan (Plate II.), and here reproduced independently as fig. 2. Its form speaks for itself so clearly that verbal description is hardly necessary.

The shape and size of the fort proper are indicated by the course of the inner ditch. It was oblong, with slightly rounded corners. The major axis ran nearly due S.W. and N.E., and had a total length of 191 feet, measured over the ditch at either side. The minor axis, similarly measured, had a length of 160 feet. After deduction for the breadth of the ditch, this gives an interior area of little more than half an acre. And the available space must have been still further reduced by the ordinary requirements of defence. There would certainly be a rampart running all the way round. As the depth of forced soil was always greater on the inner than on the outer margin of the *fossa*, it is probable that the rampart was an earthen *agger*, in the construction of which the upcast would be utilised. There were no signs of a stone foundation. The fort appears to have had but a single gateway. This stood almost in the centre of the N.E. side, and had a width, at the ditch, of 14 or 15 feet.

As will be seen from the Plan and from fig. 2, there was also an outer defence, consisting mainly, if not entirely, of a second ditch. This latter presents some rather remarkable features. The line it follows is far less regular than might have been expected, and the object of the deviations is not always easy to appreciate. The ingenious way in which it is doubled in front of the gate of the fort is, of course, readily intelligible. Again, the break just beyond the doubled section was obviously the regular entrance; its width corresponds very closely to the width of the break in the inner ditch. The apparent weakness of

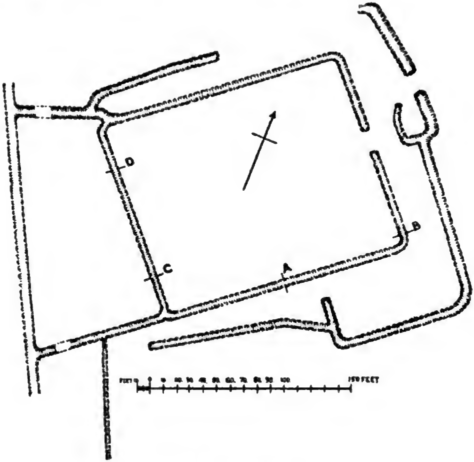

Fig. 2. The Early Fort.

the whole N.W. face is more difficult to understand. The great gap on that front seems to have been unprotected. It is, of course, always possible that it may have been covered by a palisade, or by some form of brushwood entanglement. But no evidence to that effect was forthcoming. The post-holes discovered towards its eastern end clearly belonged to a later structure; some of them had actually been sunk in the filled-up ditch.

Contiguous to the fort on the S.W. was an *annexe* having the shape of an irregular quadrilateral. Its exact form was doubtless determined by the secondary purpose which its ditches were evidently intended to serve. A comparison of Plan (PLATE II.) and Sections (PLATE III.) will show that any water accumulating in the inner ditch of the fort would be drained off westwards by the ditches of the *annexe*. At one point the southern ditch of the *annexe* dipped into a hollow, and just there it was tapped by a long conduit, dug into the clay and covered with large flag-stones. No corresponding provision was necessary on the N.W., as on that side the inclination of the ground was such that the northern ditch of the *annexe* would drain the other ditches into the most westerly ditch of all.[1] This last, it should be observed, was afterwards transformed, by the engineers of the second occupation, into the inner ditch of the later fort—a circumstance that gave not a little trouble to the excavators. They owe the solution of their difficulty to a timely visit from Mr Haverfield.

As has already been stated, the whole of the early ditches were cleared, except, of course, where they passed beneath the walls of the later or Antonine buildings. It is noteworthy that the only relic they yielded was one old shoe. The usual method of opening them was to dig a narrow trench down the centre. The earth then slipped away from the sides and was easily shovelled out. At four places, however, complete sections were cut, with the view of observing the precise nature of the stratification. The following was the result:—

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[1] It is worth drawing attention to the ingenious bending of the various ditches at the N.W. corner of the fort. The object was evidently to break the force of the water that, after heavy rain, would rush from three different directions into the northern ditch of the *annexe*.

*Section No. 1* (cut at the point A;[1] width of ditch, 9 feet; depth of ditch, 4 feet 3 inches).—This was almost entirely filled with cut pieces of turf in a wonderful state of preservation. Near the surface were a number of small bones. Roots of whin and hazel were embedded in the sides.

*Section No. 2* (cut at the point B;[1] width of ditch, 8 feet; depth of ditch, 4 feet 2 inches).—At the bottom was a depth of 1 foot 9 inches of soft clay. Then came loose soil, stones, and pieces of heathery turf. Hazel roots were again in evidence, and also fragments of branches.

*Section No. 3* (cut at the point C;[1] width of ditch, 8 feet; depth of ditch, 3 feet 7 inches).—The bottom was composed of sandy silt and vegetable matter, in a layer 1 foot 10 inches thick. Upon this there rested a mass of loose soil and stones, near the foot of which were found a few small pieces of cut wood.

*Section No. 4* (cut at the point D;[1] width of ditch, 11 feet; depth of ditch, 4 feet 6 inches).—Here 1 foot of soft clay, at the bottom, was followed by 1 foot 6 inches of vegetable matter and sand. Next came loose soil and stones. The sides of the ditch once more contained roots of hazel and whin.

Such are the main facts as ascertained by help of the spade. We have still to inquire what inferences can safely be drawn. The mere existence of the *annexe*, no less than the elaborate arrangements for drainage, proves that the early fort was more than the temporary halting-place of a detachment on the march. It was constructed to be the permanent home of a small garrison. But the period of actual occupation was very short. Had it been otherwise, broken pottery and similar debris would inevitably have gathered in the ditches. When the builders of the second and larger fort arrived upon the scene, the site had long been abandoned. The ditches had silted up to the depth of about 2 feet. Above that they were still open, but their sides were overgrown with brushwood. Half a century would seem a reasonable allowance for the transformation, and this tallies admirably with the historical data. It is beyond question that the later fort is contemporary with the Vallum of Antoninus Pius. In other words, its erection may be fixed at about 140 A.D. Going back fifty or sixty years, we find that Agricola, in the course of his fourth campaign (81 A.D.), erected a line of fortified posts along the southern side of the Forth and Clyde isthmus.[1] Three or four years later he was recalled by Domitian, and the Roman troops apparently withdrawn from Caledonia.[2] The links in the chain of testimony could hardly be forged more strongly. The early fort on the Bar Hill is to be associated with Agricola's 'conquest.' Its situation and its cunningly devised defences furnish an apt illustration of the eulogium of Tacitus: "Experts used to remark upon the exceptional sagacity he displayed in choosing suitable sites; they said that no fort planted by Agricola had ever been either taken by storm or surrendered upon terms."[3] At the same time, its size shows how slender was the force he could spare for garrison duty, how precarious the foothold he had won. It is a strange commentary on the boast which Tacitus makes him address to his soldiers: "*Finem Britanniae non fama nec rumore, sed castris et armis tenemus; inventa Britannia et subacta.*"[4]

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[1] See fig. 2.

## IV. The Antonine Fort.

### *A. General Description.*

The later or, as it may conveniently be termed, the Antonine fort was fully six times as large as its predecessor. It was more nearly square in shape, but had the usual rounded corners. For a detailed plan see **Plate II.** Measured from the inner kerb of the rampart at the gateways, the dimensions were 375 feet from W. to E. and 369 feet from S. to N. The area was, therefore, just over three acres.[1] The general situation is clearly exhibited in the sections (PLATE III.). No. 1, which passes right through the Well, runs (on line CG) from the S.W. to the N.E. corner. No 2 runs along the other diagonal (on line EA) from N.W. to S.E. No. 3 follows a line (DH) between the W. and E. gateway. No. 4 gives the corresponding line (BF) from S. to N., and is at the same time prolonged sufficiently far to include the ditch of the Antonine Vallum. A comparison of the levels will show that the fort occupied the whole crown of the hill. The highest point is not very far from the centre. The ground falls away more or less quickly on every side. Towards the N. the descent is regular and rapid.

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[1] Tacitus, *Agricola*, c. 23.

[2] *Perdomita Britannia et statim missa*, as Tacitus puts it in his *Histories* (i. 2).

[3] Tacitus, *Agricola*, c. 22.

[4] *Ibid.*, c 33.

Roy's remark regarding the peculiar position of the Bar Hill fort has already been quoted. Alone among the 'stations' on the Vallum it stands entirely detached. The others (so far as known) all abut directly on the great Rampart, which thus forms their northern bulwark. In this case the northern defences of the fort are entirely independent, although weaker than they would have been but for a consciousness of the formidable barrier that lay beyond. Fig. 3 represents the view from the inside of the N. gate. To left and right are visible the ends of the ditch of the fort, where it flanks the approach. From the gate an exploratory trench has been carried out to, and through, the Vallum, the southern kerb of which is, at this point, 120 feet distant from the outer kerb of the Rampart of the fort. The section made in the body of the rampart affords a glimpse of the great Ditch outside. In the intervening space can be seen the Military Way running westwards. Its southern margin is 78 feet from the outer kerb of the rampart at the gate.

In spite of the completeness with which the *opus valli* is described in

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[1] This calculation is only roughly approximate, being based on the dimensions stated. It should be explained that, apart from the rounded corners, the outline of the fort was slightly irregular. The N. rampart was 15 feet longer than the S., the E. 6 feet longer than the W.

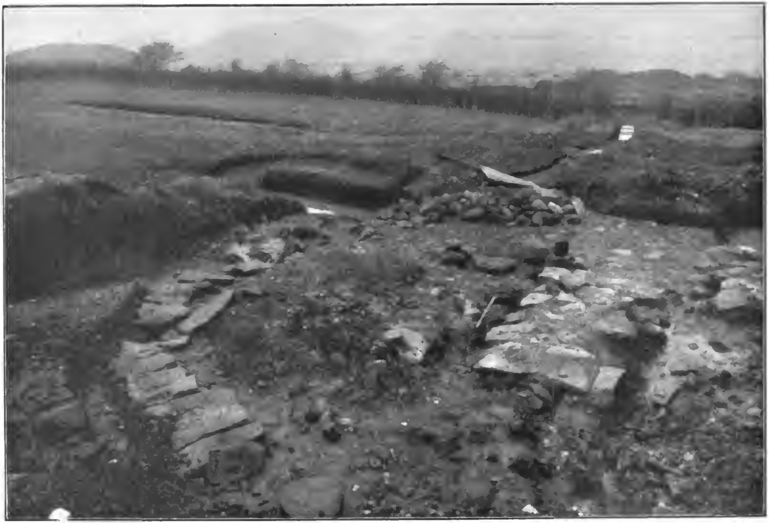

Fig. 3. The N. Gateway, with the Antonine Vallum in the background.

the Glasgow *Report*, cited above, it may be well to record briefly the result of the cuttings made on the present occasion. Fig. 4 gives a near view of the section shown in the distance in fig. 3. It brings out very clearly the general structure of the Rampart itself—the stone base, 14 feet wide, with its carefully laid kerb on either side, and the layers of turf rising above it in regular courses. At this point the turf still stands 4 feet high. Opposite the section the Ditch was found to be 14 feet deep, and to have a breadth of 40 feet—almost the maximum. The Military Way was laid bare for 140 lineal yards along the line seen in fig. 3. Fig. 5 gives a good idea of the general effect looking west. The road proved to be about 17 feet in width and excellently constructed. Its foundation was formed of a stratum of fairly large stones resting on a bed of wrought clay. This was surmounted by a convex layer of smaller stones, providing a surface whence the water must have drained

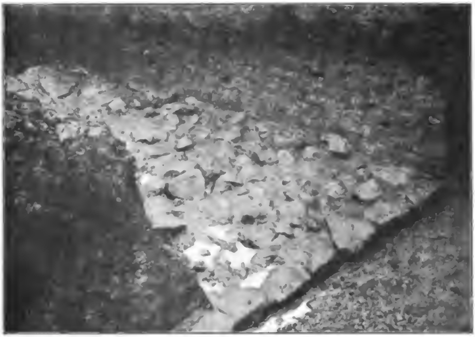

Fig. 4. Section across the Antonine Rampart.

away quickly into one or other of the two gutters that ran along the sides.

The convex 'crown' just spoken of was a characteristic feature of Roman roads generally. On the exposed summit of the Bar Hill it must have been particularly useful. There is no spot on the line of the isthmus where the rain-clouds discharge themselves more freely—a fact that lends peculiar interest to an opinion formed by Mr M'Intosh, and shared by the experienced labourers who did the digging. Certain indications which they noted have led them to believe that, when the fort was made, the whole of the space within the ramparts—if not also the ground lying to the north, as far as the Antonine Vallum—had been systematically stripped of turf and then covered with a layer of wrought clay from 7 to 8 inches in thickness. Such a layer would be impervious to rain, while the never-failing slope would effectually prevent the formation of pools. Dryness at all seasons would thus be ensured, and a coating of gravel or small stones would make walking

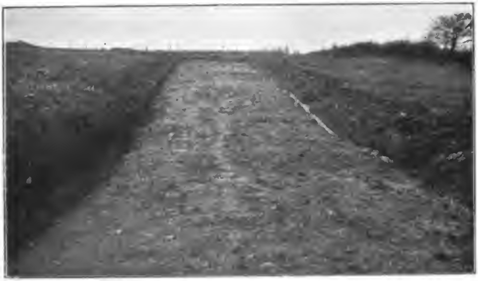

Fig. 5. The Military Way, looking W.

easy and comfortable. A precaution so eminently practical would be worthy of the best traditions of Roman engineering. So far, however, as the layer of clay is concerned, the evidence cannot be regarded as quite conclusive. Even if it be conceded that the clay within the camp differed markedly in appearance from the ordinary boulder clay of the surrounding fields, we have still to reckon with the constant going to and fro of human feet during perhaps thirty or forty years of actual occupation; assuming that the loose surface soil had first been cleared away, we should expect such trampling to produce an effect not dissimilar from 'puddling.' Corroborative testimony may one day be obtained from other sites, for it is in the last degree unlikely that the Bar Hill fort would be unique. But, in the meantime, judgment must be suspended. On the other hand, the probability that the turf and the loose soil were removed seems very strong. It will be recollected that cut pieces of turf were used at some points for filling up the ditches of the Agricolan fort. This must represent a surplusage which could not be turned to account in any other way. The bulk would doubtless be absorbed in the construction of the new defences, in a manner which will presently be clear.

### *B. The Defences.*

(*a*) *The Rampart.*—The rampart, which constituted the principal defence of the fort, was built on precisely the same plan as the great rampart of the Antonine Vallum. That is, it consisted of a wall of turf resting upon a foundation of stone. The stone foundation proved to be intact for the larger part of the way round. It had a uniform breadth of 12 feet, and was formed of two parallel kerbs of dressed stones with a mass of rubble between. Owing to the slope, cutting had everywhere been necessary in order to obtain a level bed. Hence the inner kerb was always further below the modern surface than the outer one. On the north side, to the east of the gateway, where the ground is unusually steep, the foundation had been stepped, as is done with modern foundations, the outer half being 6–8 inches lower than the inner one. Special care had been bestowed upon the rounded corners. At each of them the stones were larger and the rubble better laid, as if the superstructure were intended to be heavier. In all likelihood we have here an indication that the angles of the enclosure were fortified with towers, in accordance with the usual Roman practice.[1] One of the principal objects of such towers was to serve for the mounting of artillery. In the present instance they were probably of wood.[2] No other trace of their existence was observed, if we except the numerous ballista balls found scattered throughout the camp.

Fig. 6 will serve to illustrate the description just given of the stone foundation. It is a view of the N.E. corner, taken from the north-west, and it is interesting as showing that at this point the rampart was pierced by a well-made conduit, built of heavy, dressed stones, and having a width of 1 foot 2 inches. There was a similar conduit near the N.W. corner, but no corresponding provision could be discovered at either of the southern angles. The inner kerb is well displayed in fig. 7, which represents a longitudinal section of the western rampart, looked at from within the fort. Above the kerb can be seen a considerable portion of the original turf wall, with the familiar dark lines pencilled across its face. This and other sections were examined with particular attention. It was found that the dark lines, or carbonised strata, were generally about half an inch thick, and that they occurred at intervals of from 4 to 6 inches. These dimensions suggest that the layers of turf had been placed grass to grass,[3] a plan not uncommon to this day in the construction of turf fences. As a matter of fact, it sometimes proved practicable, by dint of cautious handling, so to separate the layers that one portion of the carbonised matter was lifted off, while the other portion remained behind. Even the original pieces of turf occasionally came away without difficulty, and then it appeared that the successive courses had broken joint. To judge by an excellent section secured near the N.E. corner, the inner face of the rampart rose at an inclination of about 1 in 4.

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[1] *Cf.* Hyginus, *De mun. castr.*, c. 58.

[2] *Cf.* the description quoted below from Arrian of the fort at Phasis (*infra*, p. 31).

[3] Otherwise the intervals between the dark lines would have been much smaller. It is true that Vegetius (iii. 8) gives 6 inches as the normal thickness of a sod cut for military purposes. But, even if the authority of Vegetius stood higher than it actually does, there would remain (1) the practical difficulty of cutting sods of such thickness in ordinary Scottish soil, and (2) the certainty that the original thickness, whatever it may have been, would be considerably reduced under pressure.

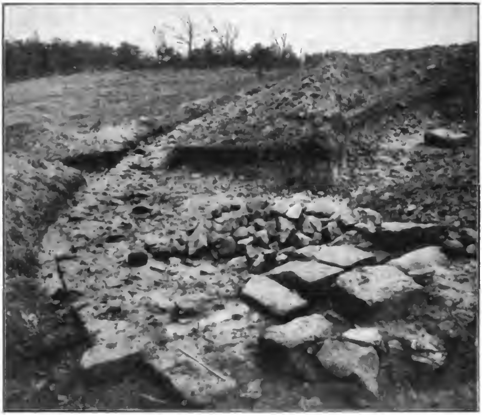

Fig. 6. Foundation of Rampart, N.E. corner, showing Conduit.

(*b*) *The Gateways.*—The fort had the normal four gateways. Those on the N. and on the S. were 8 or 9 feet nearer the western than the eastern side of the enclosure. Those on the E. and on the W. were

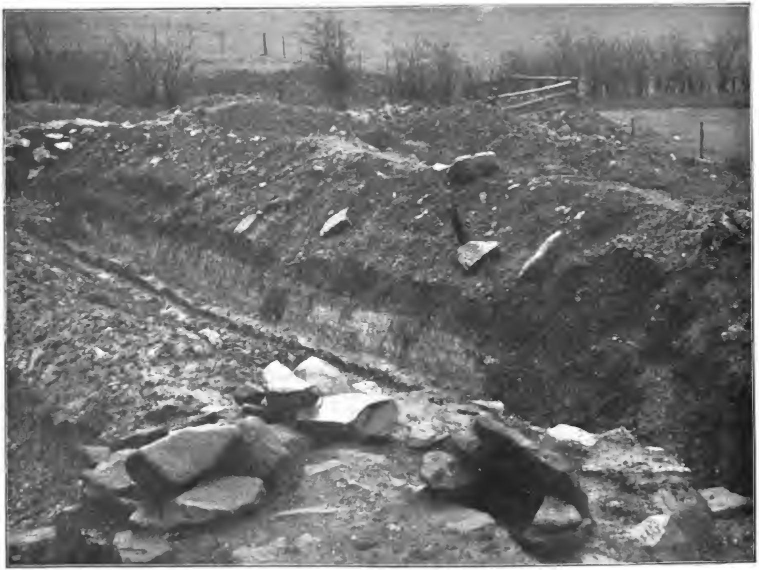

Fig. 7. Longitudinal Section of W. Rampart, looking S.

respectively 138 and 137 feet distant from the inner kerb of the northern rampart. From the southern rampart the corresponding distances were 216 and 211 feet.[1] It follows that the *Portae Principales* were almost exactly opposite one another, but that the line of the *Via Principalis*, or street passing in front of the Praetorium, was some 76 feet nearer the *Porta Praetoria* than the *Porta Decumana*.[2] All four gateways were much of the same size, being from 12 to 14½ feet wide. That on the W. was decidedly larger than the rest.[3] That on the N. was singular in having a small conduit crossing it at an angle (see fig. 3), to carry the surface water from behind the rampart into the ditch on the west of the approach. At each of the gateways, except the southern one, there was found on either side, close to the stone base of the rampart, a line of three post-holes, placed from 3 to 4 feet apart and varying in depth from 2 to 2½ feet. Every one of the eighteen holes contained the stump of an oaken post, fixed in its place by stones rammed in hard beside it. In fig. 8, which gives a view looking out through the E. gateway, the three stumps on the right hand (which are in very fair preservation) have been taken out and planted on the ground, each beside the hole to which it originally belonged. The position of the holes themselves can be best appreciated by once again turning back to fig. 3, where there is a foot-rule lying between two of them. It will be noted how near they are to the end of the stone foundation.

It must not be supposed that these stumps are the remains of the actual posts of the gates. If that had been their character, the absence of holes at the southern entrance would have been inexplicable. Their true purpose was altogether different. It is practically certain that each of the gateways was flanked by wooden towers raised on the top of the rampart. It may be presumed that, at those entrances where the stumps

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[1] It will be remembered that the E. rampart was 6 feet longer than the W. one. See *supra*, p. 16, footnote.

[2] This was the most usual arrangement; see the statistics collected by Dr Christison (*Proceedings*, 3rd series, vol. xi. p. 347).

[3] The exact figures are—N. gateway 13 feet, S. gateway 12 feet, E. gateway 12 feet, W. gateway 14½ feet.

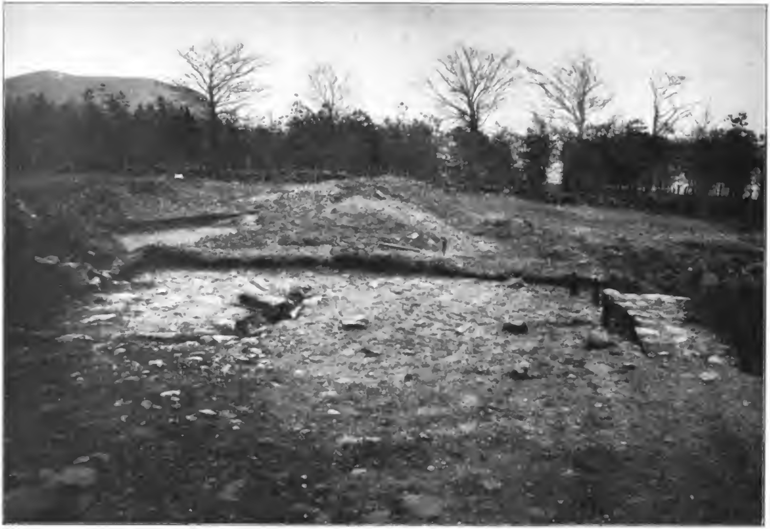

Fig. 8. The E. Gateway, with the Castle Hill in the distance.

occur, the flanking towers were connected by a wooden gangway, passing over the top of the gate and supported on either side by stout posts of oak. It will be observed that the posts were not sunk so deeply in the ground as might have been expected from their size. This may indicate that they were trussed or strutted. Struts or a 'lining' would undoubtedly add to their effectiveness in respect of a secondary object which we may believe that they were meant to serve—the provision of a facing for the turf rampart at the points where it descended perpendicularly. In view of the character of the material, some such system of protection at those points would be essential. Otherwise the main defence would have tended to crumble away under the influence of natural causes.

The exception in the case of the southern entrance has still to be accounted for. Here, although there were no post-holes, there were distinct, if imperfectly defined, traces of stone foundations, just within the fort, on each side of the gateway. This entrance, therefore, was constructed in more elaborate fashion than the others. On the W. side the surviving foundations were sufficiently extensive to be the remains of a guard-chamber, and we may conclude that there was probably a guard-chamber on the E. side also. As for the wooden gangway, it was in all likelihood supported by solid masonry. A motive for such special precautions is easy to discover. The Antonine Vallum notwithstanding, the country lying to the rear had to be regarded as at least potentially hostile. The wild tribes inhabiting it were never thoroughly subdued. It is significant that the 'stations' at Ardoch and at Birrens both turn their faces southwards. And at Bar Hill, so far as the configuration of the ground was concerned, it was the S. side of the fort that was most exposed to danger of attack. The forces of the enemy could be massed only a short distance off, on the slope of Croy Hill (see PLATE I.), while the intervening depression contains hollows where small bodies could rally for a sudden rush. That the engineer who designed the fortifications was alive to this weakness will be still more apparent when we come to describe the ditches.

Before we leave the gateways, a word may be added regarding the roads. It will be remembered that the Military Way, after passing through the Castle Hill Park, swept round to the N. to rejoin the Antonine Rampart.[1] Near the bottom of the slope of the Bar Hill proper, 110 yards away from the wall of the fort, it sent off a branch which led straight to the eastern gateway. This branch was only about 10 feet wide, and was not nearly so well made as the Military Way itself. A similar branch evidently united the Military Way with the N. gate. On the S., again, there were indications of a road running over the eastern shoulder of Creecy Hill. Whether this last was really Roman could not be determined with any certainty. If it was, it must have issued from the S. gate of the fort. On the other hand, it seemed clear that the western gateway had been but little used. Two ditches passed right in front of it without a break, and the earth that had been thrown out of them had lain virtually undisturbed. No sign of a road could be detected in the field beyond. Indeed, a road here would have been superfluous. The obvious line of communication westwards was the Military Way, and that could more easily be reached by the road connecting it with the N. gate.

(c) *The Ditches.*—The fort was defended on three sides by a double ditch. On the N., in view of the extra protection afforded by the Antonine Vallum, a single ditch was deemed sufficient. At each of the northern angles, therefore, the two ditches coming from the S. united as soon as they had fairly rounded the corner. On all sides save the W. there were breaks opposite the gates, to permit of the passage of the roadway. On the E. and on the S., where the ditches were double, the break was effected by making the outer ditch return at right angles upon the inner one. Except for these interruptions, the circuit was continuous. The peculiarity presented by the W. gateway can be readily explained. In the absence of a road, it did not seem worth while filling up the Agricolan ditch, which at this point coincided with the line of the inner ditch of the Antonine fort. Accordingly, that ditch was widened somewhat, to adapt it to its new surroundings, and at the same time a second ditch, the outer one, was dug parallel to it all the way along. While the twofold barrier thus created would add to the strength of the gate, it would not prevent its being used for a sally. In an emergency a bridge of planks could easily be improvised.

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[1] See *supra*, p. 2.

The ditches were all cut upon a uniform general plan. On leaving the surface, scarp and counterscarp sloped inwards as if destined to meet and form a V. The initial angle of descent ranged from 30° to 40°. But the actual meeting never took place. About 18 inches above the lowest level, the two sides suddenly became perpendicular, as indicated in fig. 9, the result being to provide a flat bottom, sometimes as much as 2 feet broad, sometimes no more than 8 inches. Such a device would render the trenches most difficult things to get out of, and we cannot but suppose that this accounts for its adoption.[1] If the width at the bottom varied, so did the width at the top. In this latter respect the differences between the different ditches are particularly interesting. They can be most simply shown by the following table, which should be compared with the illustrations given in PLATE IV.

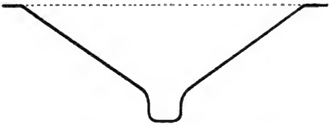

Fig. 9. Section showing shape of Ditches.

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[1] Something of the same sort has been noted on the line of the English Wall, in the case of the ditch attached to the Turf Wall at Appletree (*Trans. of the Cumb. and West. Ant. and Arch. Society*, xiv. 187).

## CROSS-SECTIONS OF DEFENCES

### TABLE OF WIDTHS[1]

| | Rampart | Berm | Ditch | Interval | Outer Ditch | Total |
|---|---|---|---|---|---|---|
| North . . . . | 12 feet | 6 feet | 20 feet | ... | ... | 38 feet |
| South . . . . | 12 ,, | 7 ,, | 16 ,, | 6 feet | 17 feet | 58 ,, |
| East . . . . | 12 ,, | 8 ,, | 16 ,, | 6 ,, | 16 ,, | 58 ,, |
| West . . . . | 12 ,, | 8 ,, | 16 ,, | 9 ,, | 13 ,, | 58 ,, |

It will be seen that only one element is absolutely constant—the breadth of the stone base of the rampart. If, however, we leave out of account the N. side, with its single ditch, we find two other features that do not change—the breadth of the inner ditch, and the total measurement from the kerb of the rampart to the further margin of the outer ditch. The differences, therefore, can hardly be altogether haphazard. How are they to be explained?

The exceptional width of the *fossa* on the N. was obviously due to the fact that it was the only defence of the kind on that face of the fort. On the remaining three sides the breadth of the outer ditch appears to have been determined by the character of the ground lying beyond. Towards the W. this was open. A limit of 13 feet was accordingly deemed adequate. It was otherwise towards the S. Attention has already been directed to the peculiar danger to which the defences there lay open. A consciousness of such danger is reflected in the formidable nature of the outer ditch, which was 8½ feet deep, and fully a foot wider than the inner one. We may trace evidence of the same feeling of insecurity in yet another precaution. The gap admitting the road from the S. was completely 'covered' by a short ditch or *titulus*, some 30 feet long, 12 feet broad, and 7 feet deep—an effective check to the force of a direct charge. Similar care was called for on the E. There the rampart overlooked the green basin of the Castle Hill Park. At first the slope was gradual. After 30 or 40 yards it became steeper, and at one part the descent was sufficiently abrupt to conceal a portion of the hillside from the view of the defenders. Special measures were taken to cope with these conditions. On the E. the outer ditch was 3 feet wider than on the W., while the gateway was 'covered' just as was the gateway on the S. The covering ditch, however, was not a mere *titulus*; it was too large for that.[1] Beginning opposite the gateway, 25 feet from the outer ditch, it ran parallel to the main ditches for a distance of 93 feet towards the S. It is significant that it occupied the crest immediately above the expanse of 'dead' ground that has just been referred to. An attacking party emerging from the hollow would have found themselves immediately confronted by an obstacle not less than 14 feet wide and 6 feet deep.

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[1] The figures are taken from sections (see Plate IV.) very carefully made—two on each side, at the points indicated in Plate II.—for the express purpose of securing accurate measurements. At the same time they ought to be regarded merely as reasonable averages. The lines of the ditches were not drawn with mathematical exactitude.

Finally, it may be noted that the depth of the ditches was by no means uniform. The outer ditch on the S. side represented the maximum (8½ feet). The average all over was from 1 to 2½ feet less. Even in the case of the same ditch there were sometimes very considerable variations. On the W., for example, for a distance of some 20 feet in front of the W. gateway, the two ditches were no more than 3½ feet deep. This was on or near the summit of the hill. Lower down, they made a much closer approach to the average. Similarly, the single ditch on the N. was 7½ feet deep beside the gateway, but more than 8 feet at its western end. The lack of uniformity as between different ditches, and even (occasionally, at least) as between different parts of the same ditch, was partly the result of subsequent levelling of the ground. But it may also have been largely due to the varying requirements of defence; where the danger was greatest, the ditch would be dug deepest. Convenience for purposes of drainage was probably also a regulating factor. In this connection it should be observed that the only overflow drain that could be discovered was one that ran due N. from the N.W. corner, the lowest point of the whole enclosure. And here the primary object was to carry off the sewage of the fort in the direction of the great Ditch of the Vallum. At the other corners the engineers seem to have depended on the drying influences of nature. Normally, of course, the ditches of the fort were intended to be free of water. Yet during heavy rain they must often have contained a large accumulation, and there is no more striking proof of the pains bestowed upon their construction than the special means taken to protect the two corners that were lowest and, therefore, chiefly exposed to risk of damage —those at the S.W. and the N.W. respectively. It is towards these points that the fall of the ground is most rapid, and it would be the ditch nearest the camp that was most liable to sudden flooding. In the centre of that ditch, at each of the corners named, there rose a solid bank of wrought or 'puddled' clay, 35 yards in length round the curve, 2½ feet in height, 2 feet wide at the bottom and 1 foot wide at the top. When the loose earth was cleared away by the excavators, these banks were found intact.

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[1] *Per latitudinem portarum similiter fossa fiet, quod propter brevitatem titulum cognominatum est* (Hyginus, *De mun. castr.*, c. 49).

In the light of the descriptions just given, it will not be hard to conjure up a picture of what the outward appearance of the Antonine fort must have been while it was entire. That picture would be typical of most of the second-century Roman forts in North Britain. And it may be interesting to compare it with the following verbal sketch of a frontier post in quite another portion of the Empire. In his *Periplus of the Euxine Sea*,[1] Arrian, then governor of Cappadocia, thus writes to his master Hadrian regarding the 'station' at Phasis, the most easterly city on the Black Sea coast:—"The fort itself, which is garrisoned by 400 picked troops, occupies a position which appeared to me at once very strong by nature and admirably calculated to secure the safety of those approaching the town by sea. Two ditches run round the rampart, both of them broad. Formerly the rampart was of earth and the towers planted on it were of wood. Now both rampart and towers are made of brick. The former rests on a substantial foundation, and has artillery mounted upon it. In a word, the preparations for defence are so complete that there is little likelihood of any of the natives coming to close quarters or of the garrison ever being called upon to stand a siege."

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[1] Cap. 12.

From the point of view of construction, the fort on the Bar Hill and that at Phasis both belong to a period of transition. Ramparts of turf and ramparts of brick were alike intermediate between the earthwork, pure and simple, and the wall of stone. But the stages they represent should perhaps be regarded as parallel rather than as successive. As a matter of fact, the Phasis fort, with its brick ramparts, was the earlier of the two (*circa* 130 A.D.). That the alternative material was employed at Bar Hill, as it was elsewhere in North Britain, was in some degree the result of accident. Bricks would have had to be made, whereas turf of excellent quality lay ready to hand upon the spot.[1] If we allow for this difference, the resemblance between the two *castella* is exceedingly remarkable. It may have extended even to their size. According to the basis of calculation laid down by Hyginus, 21,600 square feet were required for the housing of an infantry cohort of 480 men. Measured by this criterion, Bar Hill could have held 1400 or 1500 men, even assuming that only half of the available ground was occupied by barracks. But the specifications of Hyginus refer to the temporary camp of an army on the march, where economy of space was a consideration of importance; it is futile to try and apply them to a permanent 'station.' On the reasonable supposition that the Bar Hill fort was designed for the comfortable accommodation of a recognised military unit, common sense would suggest that its normal garrison was a single cohort, 480 strong. It may have been more or less according to special circumstances.

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[1] Mr Haverfield (whose unwearying assistance we would take this opportunity of acknowledging) points out to us that there is another consideration to be weighed: the East was probably ahead of the West.

### *C. The Interior Arrangements.*

When we turn from the defences of the Antonine fort to examine what lay behind them, we find the wreckage much more fragmentary. The raider, the drainer, and the ploughman have done their work thoroughly, according to their lights. Of all that came within their ken, they have left but little for the archaeologist. There is one notable exception. As we shall see by and by, the evidence suggests that it is to the destructive energy of one of the earliest bands of spoilers, whether Roman or Caledonian, that we owe the great accumulation rescued from the Well. But for this, the harvest of structural remains would have been singularly poor. At the best, any conception we can form of the once busy interior will be blurred and defective. Yet some features of interest ought to stand out with tolerable clearness. The Headquarters Building was in every sense the most important, and with that we shall begin.

(*a*) *The Praetorium.*—The Praetorium—or, as it might perhaps more correctly be termed, the Principia[1]—occupied the usual position in the centre of the fort, and faced north. When Mr Whitelaw's excavations commenced, no trace of it was visible. Eventually, however, its main outlines were recovered, thanks to the substantial manner in which the foundations had been constructed. The method of the Roman builder had been as follows. As a commencement, a deep trench, from 2½ to 3 feet wide, was dug along the proposed line of wall. The bottom of this was filled, to the depth of about a foot, with wrought clay. Into the clay there were driven a number of small stones from 3 to 4 inches in diameter. Upon the *statumen* so formed, a course of rough rubble was laid. Above that came a course or two of dressed stones, and then—the real beginning of the wall—a fresh course of stones, better dressed, and so much narrower than the lower one as to leave a scarcement of 3 inches on either side. Fig. 10 will serve to illustrate some of the points just mentioned. It is a view taken from the interior, looking N., and represents the most southerly portion of the E. wall, with the end of one of the cross-walls abutting on it.

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[1] See the inscription from Rough Castle, published in the last volume of the *Proceedings* (1905, vol. xxxix. pp. 470 and 472). The building also gave a name to the street upon which it opened, the *Via Principalis*,—'*quae a principiis nomen obtinet*' (Hyginus, *De mun. castr.*, c. 14).

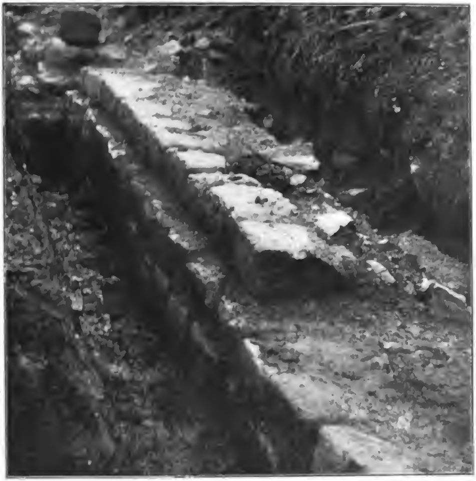

Fig. 10. E. Wall of the Praetorium, looking N.

A good idea of the ground-plan can be formed by a glance at fig. 11. The usual width of the foundations was 2½ feet, but the foundation of the S. wall was 3 feet wide. It will be observed that the structure, which had an outside measurement of 83 feet long by 77 feet broad,[1]

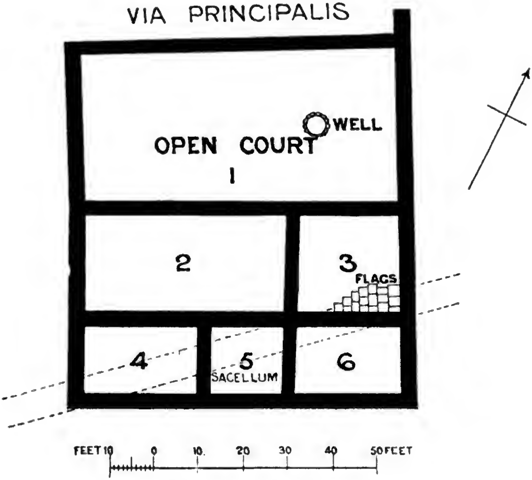

Fig. 11. Ground-plan of the Praetorium.

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[1] The 6-foot projection shown on the Plan at the N.E. corner was not a buttress. The slope towards the E. was steep here, and a line of large stones had been laid down to protect the gutter and roadway beneath them.

consisted of three main divisions. The most southerly of these contained three separate chambers (Nos. 4, 5, and 6). To what extent the division in the centre was broken up is doubtful. But the one towards the N. had certainly no partition walls. Although all traces of the doorway have disappeared, we cannot doubt but that the entrance was from the N.—in other words, direct from the *Via Principalis*. And we may be sure that the door was in the centre, so that, when the soldier crossed the threshold, his eye might travel straight along a vista to the central chamber on the S. This little apartment (No. 5), 15½ feet square, was the *sacellum* or shrine, where the standards were kept—the sanctuary consecrated to their worship and to that of the Imperial House. Usually the *sacellum* had two rooms—probably business-rooms of some sort—on either side of it, making a row of five in all. But the seeming use of only three can be paralleled from elsewhere—from Hardknott in Cumberland,[1] for example, from Melandra in Derbyshire,[2] and apparently from Rough Castle.[3] In the present instance the two side apartments were considerably larger than the one in the middle. The back walls of Nos. 4 and 6 measured 25 feet and 24 feet respectively, as against 15½ feet in the case of No. 5. All three rooms appear to have been paved with freestone flags, from 2 to 3 inches in thickness.

When we leave the part of the Praetorium lying to the S. and pass to that in the centre, the task of interpretation becomes much harder. To judge from analogies at Birrens, Housesteads, and elsewhere, an open court might have been confidently expected. But the evidence against such a view appears to be conclusive. The eastern end would seem to have been a separate room, about 22 feet square, and paved with flags. The dividing wall and the remains of the floor were unmistakable. Some of the flags still *in situ* are shown in fig. 12, which gives an outside view of the wall already reproduced in fig. 10. Whether there had been a corresponding room at the western end, it was impossible to determine

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[1] *Trans. of the Cumb. and West. Ant. and Arch. Society*, vol. xii. p. 386.

[2] *Melandra Castle* (Manchester, 1906), Plan; and also *Victoria County History of Derbyshire*, vol. i. p. 212.

[3] *Proceedings*, 1905, vol. xxxix. p. 472.

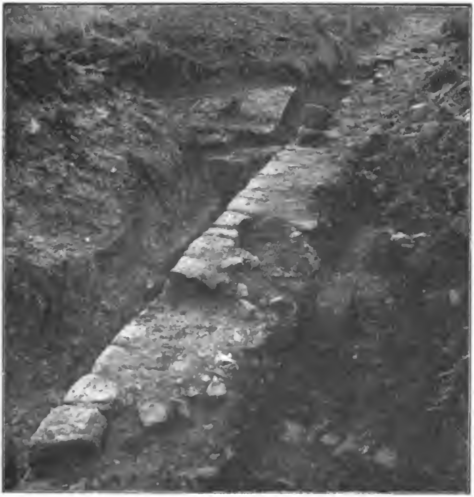

Fig. 12. E. Wall of Praetorium, with remains of Paving, looking N.

definitely. No positive indications were observable, and in such a case considerations of symmetry can hardly be allowed to carry weight. On the other hand, it is not unimportant to observe that a division of No. 2, in the manner just suggested, would have provided the normal number of four business-rooms in close proximity to the *sacellum*.[1]

A peculiar interest was associated with the S.E. corner of Room No. 3. The southern end of the Praetorium was partly built over the inner ditch of the Agricolan fort. As the dotted lines in fig. 11 show, the line of the ditch enters below the S.W. corner of Room No. 4, passes across this and across the *sacellum* in a north-easterly direction, runs under the dividing wall between Room No. 6 and Room No. 3, and then under the flags in the S.E. corner of the latter, finally emerging just beyond. Where the actual foundations were to be laid above it, the bed of the early ditch has been packed with broken freestone, instead of being merely filled with earth or turf. But even this precaution has not proved sufficient. At some time or other, probably soon after the erection of the building, there has been a marked subsidence on the line of the dividing wall chiefly concerned, and the flags in the S.E. corner of Room No. 4 have also sunk considerably. These phenomena are well exhibited in fig. 13, which gives a view of the wall and flags, looking E.

The general character of the front or northern division of the Praetorium was not difficult to determine. It had been an open courtyard, about 70 feet by 34 feet, apparently floored with clay and a stratum of small stones. In its eastern half was the Well, whose discovery and clearance have already been described. This well, it will be remembered, was 43 feet deep and 4 feet in diameter, and was 'cradled' all the way down with dressed stones. The lowest course of the 'cradling' rested on five well-squared oaken beams arranged in the form of a pentagon. Examined from above, the whole produced a strong impression of the thoroughness and durability of Roman workmanship. It is fair to add that some, at least, of those who ventured to the bottom experienced a rather different sensation as they looked up and saw the bulging sides project in clear relief against the small circle of bright sky. The contents—a full record of which is reserved for the Appendix—furnished important evidence as to the original appearance of this part of the fort, a centre where officers or soldiers must often have foregathered.

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[1] The same end might, of course, have been attained by the use of wooden partitions in No. 4 and No. 6. And such an explanation of our difficulty would have much to commend it. The W. wall of No. 3 would remain a very puzzling fact.

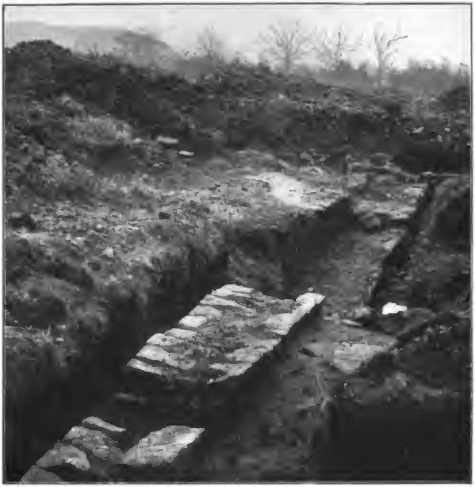

Fig. 13. Partition Wall in Praetorium, showing subsidence on line of Agricolan Ditch.

It is certain that a colonnade of stone pillars ran round at least a portion of the open court. Careful search was made for the substructures on which the bases must have rested, but all trace of them had vanished. The proof supplied by the extant remains is, however, convincing. These will be subjected to detailed examination at a later stage.[1] In the meantime a general statement must suffice. There were extracted from the Well 21 columns or pieces of columns, 14 bases, and 11 capitals. A twelfth capital was subsequently recovered from the refuse-hole distinguished on the Plan as No. 7. Placed end to end, the columns would cover a distance of 64 feet. Their diameters averaged from 10 to 13½ inches, and each of the three tallest was rather more than 5 feet high. A characteristic group is reproduced in fig. 14. The bases were fairly uniform in appearance; but there was some variation among the capitals, a few of them being decorated.

Next to the colonnade, the Well itself was probably the most conspicuous feature of the courtyard. It was worked by means of a rope running on a wooden pulley. Parts of the bucket and of the pulley, as well as of the wooden framework to which the latter had been fastened, were among the 'finds' of special interest recovered from its depths. The debris from the Well also included a good many bits of squared oak, one of them as much as 9 feet long,—remains which might suggest that the framework had been protected by a wooden shelter. That is, of course, quite possible. But it is more probable that the beams in question had formed part of the roof of a covered walk inside the colonnade.

(*b*) *The Storehouse.*—Immediately to the E. of the Praetorium was a street, running N. and S., and having a width of 10 feet between the inside margins of its two stone gutters. On the other side of this street rose a long, narrow building of stone, which may with confidence be identified as a storehouse. Its foundations lay parallel to those of the Praetorium, and were just about equal to them in length (85 feet). One or more such structures have been found in every Roman fort in Britain that has been explored with any degree of completeness. They are generally situated in the immediate neighbourhood of the head-

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[1] See *infra*, "Note on the Architectural Fragments."

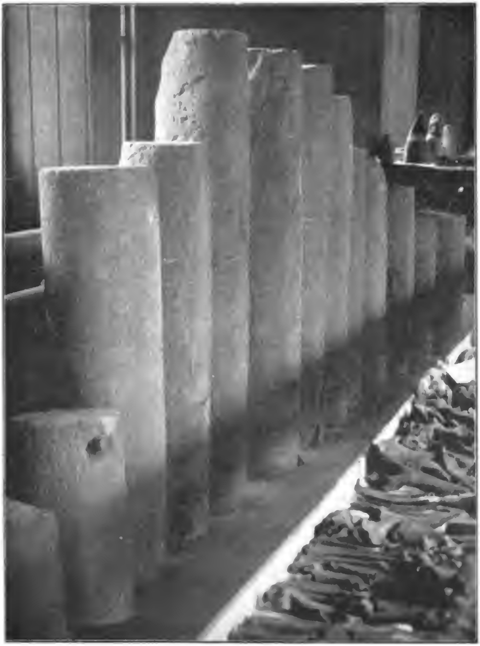

Fig. 14. Shafts of Pillars, recovered from the Well.

quarters building. The grounds for supposing them to be granaries or storehouses have been well stated by Mr Bosanquet in his account of the excavations conducted under his supervision at Housesteads.[1] In some respects the Bar Hill example represents a departure from the normal type. In particular, its outside walls were less thick than is usual —being only about 2 feet—and they were *not* supported by buttresses. Again, compared with the great majority of similar structures elsewhere, it was remarkable for its relative breadth (32 feet). With a length of 85 feet, we should not have expected it to be more than from 20 to 25 feet wide.[2]

A stone partition divided the Storehouse longitudinally into two slightly unequal halves. Probably this is the explanation of the peculiarities just enumerated. If there were to be two divisions, the whole would require to be broader than is usual. On the other hand, the partition could be so utilised as to relieve the side walls of much of the pressure of the heavy roof with which we must suppose the granary to have been provided. Buttresses would thus be rendered unnecessary. Of the two halves, the eastern was the larger. It had an interior width of 13 feet, and had evidently been paved with flags, as pieces of flagstone were found lying undisturbed in the bottom. The western half was only about 11 feet wide. Its floor was doubtless also formed of flags. In this case, however, recourse had been had to a method of construction that is frequently associated with such buildings. In order to guard against damp, the flags had been supported by three dwarf walls that ran from one end of the division to the other. A good many ashes were observed in the northern portion of the free spaces so provided, but there was nothing to indicate when or how they had accumulated there. About 17 feet from the N. end were traces of what appeared to be a cross wall. It became obvious during the excavations that the two most easterly of the dwarf walls, taken along with the stone partition,

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[1] *Arch. Ael.*, xxv. pp. 237 f.

[2] See Bosanquet, *l.c.* His statistics are entirely borne out by sites examined since the publication of his paper, *e.g.* Castlecary, Rough Castle, and Gellygaer.

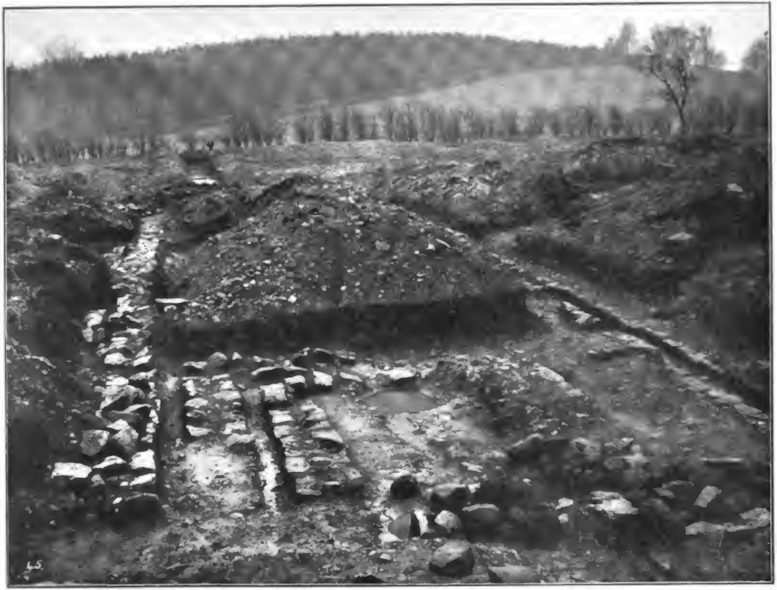

Fig. 15. The Storehouse, looking S.

represented the "three rows of ruins" shown very prominently in Gordon's plan, and spoken of by Horsley as being still visible "within the Praetorium."[1] Fig. 15 gives a view, looking south, of the northern end of the "three rows," as they appeared when uncovered in 1903. The third dwarf wall and the main wall on the W. are barely distinguishable. Towards the right the stone gutter on the E. side of the street is very well seen.[2]

(*c*) *The Workshops.*—To the E. of the Storehouse were the remains of yet another building of stone. It had been sadly mutilated. None of its details were ascertainable. Even the limits of its foundations could not be certainly fixed, although it must have covered an area of not less than 41½ feet by 33 feet. The fact that it had contained the workshops seemed tolerably clear from the nature of the objects found within what was left of its walls. These included quantities of ashes and other indications of large fireplaces, the remains of flues, many pieces of wrought iron, a number of iron nails, and—most significant of all—much iron-slag and glass-slag. Near the S.W. corner a well-preserved flue entered the building from the E.

(*d*) *The Baths and Latrines.*—After the Praetorium itself, the most extensive stone structure discovered was a range of buildings that stretched nearly the whole way from the N. gate to the N.W. angle of the fort, at a distance of not more that 4 feet from the rampart. Measured over the foundations, it was about 15 feet broad, and rather less than 150 feet long. The general view, looking eastwards (fig. 16), conveys a good impression of its dilapidated condition. While it had evidently been a continuous suite of apartments, three clearly marked divisions had existed. Before entering on a particular description, we may mention that the N. ditch, opposite the two higher or more easterly

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[1] See *supra*, p. 5.

[2] The pool of water in the centre of the foreground marks a hole dug to verify the line of the Agricolan ditch.

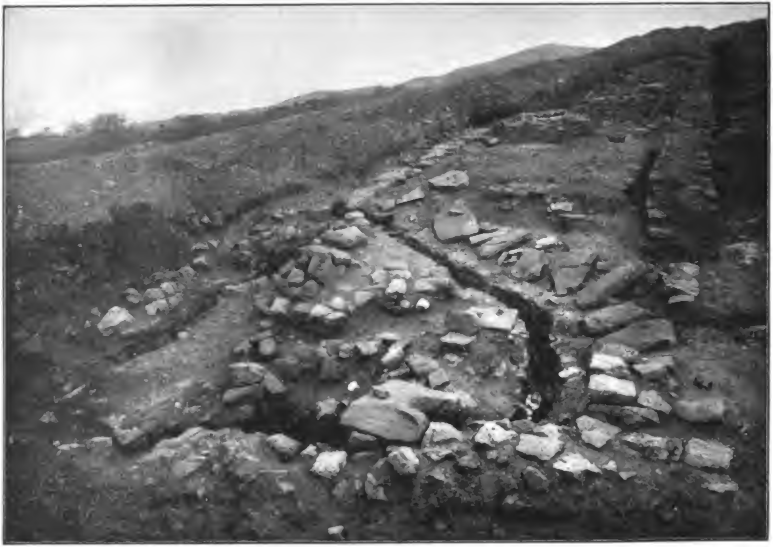

Fig. 16. General View of Latrines and Baths, looking E.

divisions, contained many fragments of small clay bottles such as might have been used for holding unguents, and also that in the very same neighbourhood, but on the inner side of the rampart, there were picked up five loose coins—one of silver and four of copper—as well as broken and corroded pieces of several others. These facts are in complete accord with an inference to which the character of the ruins themselves will be found to point. They indicate that a good deal of money changed hands in or about the building, and that some of the rooms were devoted to purposes connected with the toilet. In other words, they suggest that what we have here is the wreck of the public baths and their ordinary adjuncts.

An examination of the internal arrangements renders the conclusion a certainty. The division next the gate yielded quantities of stones, ashes, burned wood, and broken pottery of the coarser sort. Its lower portion was furnished with a hypocaust, the brick pillars of which crumbled away rapidly when exposed to the frosty atmosphere. Much cement had been used in its construction; many large pieces nearly as hard as stone were among the fragments. It must have been a *caldarium* or a *tepidarium*, or both, for it had had a regular water-supply laid on. The waste was carried off at the back by a drain, 6 inches wide and 15 inches deep. The fresh water came from a reservoir or tank that stood on a slightly higher level, about 23 feet to the S. of the eastern extremity of the main building. Fig. 17 represents this Reservoir, looking N., with the ruined hypocaust in the distance. It will be seen that it was a rectangular pit, 12 feet long by 6 feet wide. There was a step across the centre of the bottom, the western half being 3 inches lower than the eastern. The sides had originally been protected by masonry, and the floor was roughly paved with stones laid on a well-packed bed of puddled clay. The whole had at one time been covered by a roof or canopy, as was proved by the discovery of the stump of an oaken post in each of the four corners. Had these posts been sunk deep enough to give them a hold at once secure and independent, they would have penetrated the puddled clay and so caused a leakage. Accordingly, they were merely

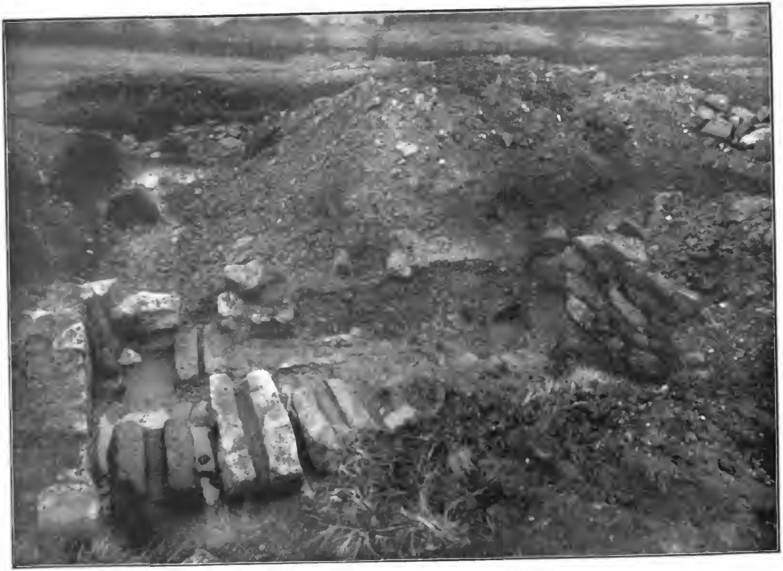

Fig. 17. Reservoir for the Baths, looking N.

planted on stones lying above it. The necessary support or 'bracing' was provided by tenon-struts mortised into them about 6 inches from their lower end. In the illustration the mortise-hole can be distinctly seen in the stump that is leaning against the left-hand corner of the northern wall of the reservoir. The channel-stone just to the right is lying in its original position, and was evidently the outlet. The three similar stones in the foreground were got face downwards in the bottom, as if they had been thrown in by hands intent on destruction. Probably they formed the inlet.

Returning to the Baths, we find that the division in the centre was likewise provided with a hypocaust. This was on a somewhat lower level than the one already spoken of, and its pillars were of stone, not of brick. The mouth of the furnace and some of the pillars are shown in fig. 18. In one or two instances the flagstones of the floor are still poised upon the top. The confused heap beyond represents the remains of the upper hypocaust. It was remarked that the centre division had had no communication with the drain that passed immediately behind it. It was not, therefore, used for bathing in the strict sense of the term. But its position as a member of the suite goes to prove that it was the bathers who frequented it. Possibly it was a *Laconicum* or sweating-room. Or it may have been merely a comfortably warmed apartment for dressing or undressing, and for lounging. Or it may have served both purposes, as did the *apodyterium* in Quintus Cicero's villa near Arpinum.[1]

Regarding the nature of the lowest or most westerly division there can be no manner of doubt. It contained the Latrines. These were situated at the precise point in the fort where the fall of the ground was most rapid. Turning back to fig. 16, and comparing it with the Plan on PLATE II., we may note the system of drainage. A stone gutter ran all the way in front of the other two divisions. It probably collected the rain from the roof. Immediately below the furnace of the stone hypocaust it was diverted towards the N. and taken obliquely through the wall into the Latrines—possibly an indication that the latter had

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[1] Cicero, *Ep. ad Quintum Fratrem*, III. i. 2.

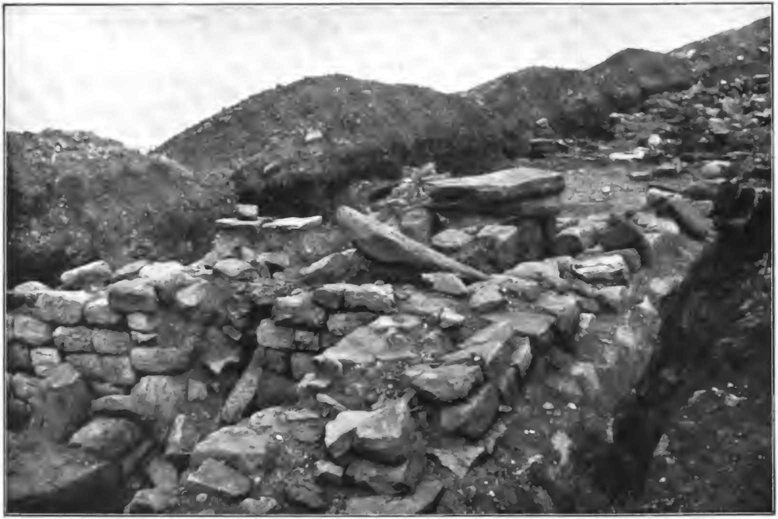

Fig. 18. Remains of Stone Hypocaust in the Baths, showing Mouth of Furnace, looking E.

no roof for rain to drip from. The drain that carried off the waste from the upper portion of the Baths was the main source of the water used for flushing purposes. During nearly its whole course it was closed in with stone covers. About 20 feet from the W. wall of the building it sent off a branch that crossed the lowest division at an angle towards the S.W., and then turned northwards to fall once more into the main stream. This branch (which, as the illustration shows, had also been partially covered) formed the actual latrine trench, and the outflow of sewage was ultimately led through the N. ditch by a conduit raised a little way above the bottom. The stone with a perforated hole, in the foreground of fig. 16, is a somewhat curious relic. It was found on the top of the latrine trench, just where it lies in the picture, and it shows that the seats were of stone.

(*e*) *Other Buildings of Stone.*—More or less doubtful indications of other stone buildings came to light here and there; but there was nothing that could be called definite or certain. And there was at least one remarkable blank. There was no evidence to show what had lain in the western section of the *latera praetorii*—the space corresponding to that occupied by the Storehouse and the Workshops on the E. It would be a natural enough situation for the private quarters of the commandant of the garrison. This would probably be a stone house, with hypocaust installation underneath some of the floors. The supposition that such a house was among the buildings that once stood here may perhaps help us to find a clue to their utter disappearance. The "vaults . . . . covered above with flat-bricks," which are mentioned in the old *Statistical Account of Scotland*,[1] were undoubtedly hypocaust chambers. They are described as being "still entire" when accidentally revealed in 1791. Unless they were speedily and carefully buried again, their destruction would inevitably follow. That they were so destroyed is all the more likely, if their discovery was associated with a search for stones or with an endeavour after agricultural improvement.

[1] See *supra*, p. 6.

(*f*) *The Wooden Barracks.*—The outstanding features of the rest of the area of the fort—*praetentura* and *retentura* alike—were the barracks of the soldiery. These were long, narrow buildings, corresponding in a general way to the *hemi-strigia* of Hyginus.[1] At Bar Hill, in accordance with the most usual custom, they lay parallel to the *Via Principalis.* As at Ardoch, they were of wood. No sleeper-tracks were observed; but the number of post-holes recorded was considerable.[2] Close upon 150 of the latter will be found marked upon the Plan (PLATE II.). With a diameter of about 2 feet, they were usually from 2 to 3 feet deep. In nearly every one of them was found the end of a round oaken post, which had been carefully wedged in position with stones. The stumps indicated an original diameter of from 6 to 8 inches, and the tallest surviving fragment was about 3 feet high. They had usually a charred appearance on the top, as if the original posts had been destroyed by fire. Even where a continuous line was secured, the distances between the holes tended to be rather irregular. Sometimes the interval was as much as 7 to 8 feet, sometimes it was only 2 or 3. The vista reproduced in fig. 19 will illustrate most of the points just mentioned. It shows the longest series, looking westwards. For the purpose of the photograph the stumps have been removed from the holes, and set up upon the ground.

Beyond the bare facts stated above, there is not much to be said about the Barracks. The material is too scanty to justify any but the most general conclusions. We cannot even say how many separate blocks there were. The *retentura*, or southern portion of the fort, contained indisputable vestiges of three, numbered III., IV., and V. upon the Plan. We may be sure that there was a fourth close beside them. It is hardly likely that there were any others. In the *praetentura* the remains were far less abundant. Only two wooden buildings—numbered I. and II. upon the Plan—could be positively located north of the Praetorium, and

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[1] See Mr Bosanquet's luminous discussion in *Arch. Ael.*, xxv. pp. 228 ff.

[2] For an explanation of the two methods of construction, see Mr Cunningham's sketches in the Ardoch Report (*Proceedings*, 1898, vol. xxxii. pp. 445 f.)

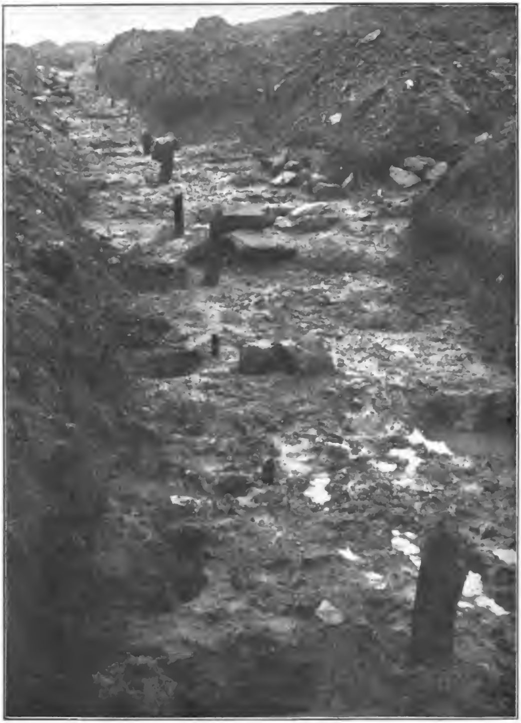

Fig. 19. Line of Post-holes, with remains of Wooden Posts, looking W.

one of them was represented by but five post-holes. At the same time, the space available here was much more extensive, and the measurements lead one to suppose that in this quarter there must be not less than three wooden buildings altogether unaccounted for. That would give a total of at least nine for the whole fort, the odd number being explained by the intrusion of the Baths.

The best preserved of the Barrack Blocks was the one that lay in the extreme S.W. (No. V.). If we include all the post-holes that appear to have belonged to it and to its adjuncts, we get a length of 123 feet and a breadth of 31 feet—a fairly close approximation to the dimensions given by Hyginus for the equivalent unit in a temporary camp (130 feet by 30 feet). It can, however, be proved that the actual building was not quite so large. Fig. 20 is a view, looking eastwards, along the more northerly of the two longest rows of holes that marked its outline. Observe the line of stones set up on edge behind the posts. The purpose of these was obvious. The building lay upon a slope, and the stones were intended to prevent the water that ran down the hill from making its way beneath the wall. This, therefore, was the true back. Measured from here to the front, the breadth was 24 to 25 feet. Similarly, measured from the western extremity of the line of stones, the length was not more than 110 feet. It was only 87, if the most easterly of the three cross rows represents a verandah and not a partition. The acceptance of the last hypothesis would deprive us of any evidence for a division of the building into compartments. But the original existence of such compartments would remain beyond doubt. The testimony from other sites is decisive. Incidentally, the stones set on edge furnish proof that this block of barracks faced towards the S. That was a marked advantage. In the case of a sudden alarm, it would be the work of a moment to man the southern rampart.

The vista of fig. 19 exhibits almost all that was left of the two more northerly of the Barrack Blocks in the *retentura* (Nos. III. and IV.). It is taken from the eastern end. Although the post-holes seem, in the illustration, to stretch in an unbroken line, there is really (as the Plan on

PLATE II. will show) a gap of some 23 feet in the centre, marking the

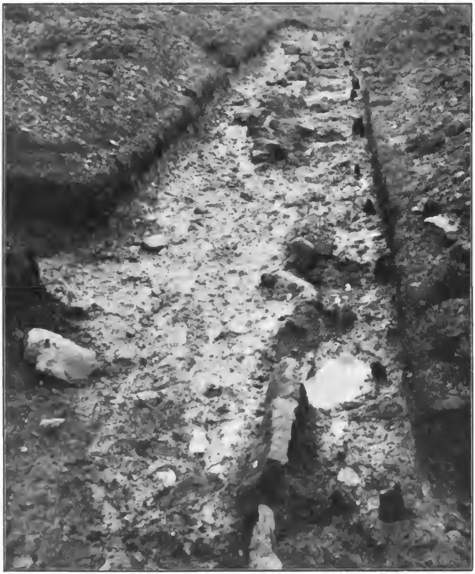

Fig. 20. Post-holes and Stones set on edge at back of Barrack Block No. V., looking E.

passage of a roadway from the S. gate. Judged by the holes, the two different buildings thus represented would appear to have been respectively 113 and 115 feet long. Regarding their breadth we cannot speak positively. There were, however, clear indications that it was towards the Praetorium that they extended; other post-holes were found to the N. of both halves of the line. The doubling of the row at the eastern end of what would thus be the S. wall of No. IV.—a feature distinctly reproduced in the figure, and still better seen in the Plan (PLATE II.)—can be interpreted with some approach to confidence. It would appear probable that the building had been L-shaped, with a verandah at the end, much like certain of the stone barracks at Gellygaer and at Chesters.[1] If this was so, the verandah must have been almost 4 feet wide and between 40 and 50 feet long. The meagre remnants of barrack blocks in the *praetentura* have little to tell us. One building (No. II.), part of whose outline is traceable on the E., had been 22 feet broad. With the five solitary post-holes on the W., which are all that is left of No. I., there was associated a curious hole or pit, 5 feet long, 4 feet wide, and 5 feet deep. At the bottom of this was a trough made of four flagstones set on edge round a fifth flagstone that lay flat. These were held in place by stout wooden stakes. The trough so formed was 8 inches deep, 2 feet long, and 1 foot 3 inches broad. It may have been connected with the mess-kitchen which, following the usual arrangement, would probably occupy one end of the building to which the five posts belonged.

(*g*) *The Streets.*—We have already had occasion to mention that a street, 10 feet wide, divided the Praetorium from the Storehouse. Allusion has also been made to the *Via Principalis*. Considerable traces of the latter could be distinguished; its eastern half must have been one of the best-trodden portions of the fort. The same remarks apply to the *Via Praetoria*, which led from the courtyard of the

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[1] See *The Roman Fort of Gellygaer*, pp. 65 ff. Three buildings of this shape were also found at Camelon. There, however, no verandahs were traced. In all these instances the narrower end of the building pointed inwards. At Bar Hill, if the structure was similar, it pointed outwards.

Praetorium straight to the N. gate. Again, the arrangement of the wooden barracks in the *retentura* undoubtedly points to the existence of a now vanished street that had passed from the S. gate to the back of the Praetorium. Besides these four, the only other which we can identify with certainty was one that ran round the interior margin of the southern defences, occupying (so far as that side of the fort was concerned) very much the position held by the *Via sagularis* in the temporary camp of Hyginus. Its remains are shown on the right in fig. 21, at the spot where they were most extensive. The post-holes on the left of the illustration belong to the S. front of Barrack Block No. V., the view being taken from the W. The street itself was 7 to 8 feet wide. Towards the W. its outer kerb was about 17 feet behind the inner kerb of the stone base of the rampart. Further E. the corresponding interval was only 15 feet. At its western end, if not also at its eastern one, there were faint indications that the street may have rounded the corner with an easy curve. Was it continued along the line of the defences on the other three sides of the fort? To this question no positive answer can be given. If it was, then we can see that, after crossing in front of the N. gateway, it must have swung slightly southwards, so as to leave the Baths and Latrines in what Hyginus calls the *intervallum*.

(*h*) *Fireplaces.*—Remains of rude hearths or fireplaces were found in various directions throughout the fort. Many of these must mark the site of the camp-fires that warmed the soldiers' quarters. Probably there was one sunk in the floor of each of the compartments into which the wooden barracks would be divided. But they could not all have been of this nature. Among the most notable exceptions were three that lay in a row, close to the rampart on the W. side of the fort, about midway between the gate and the S.W. corner. Built of stone, they were circular in shape, 7 or 8 feet in diameter, and about 3 feet high. They had evidently been much used, although nothing survived to suggest their real purpose. Whatever that purpose may have been—

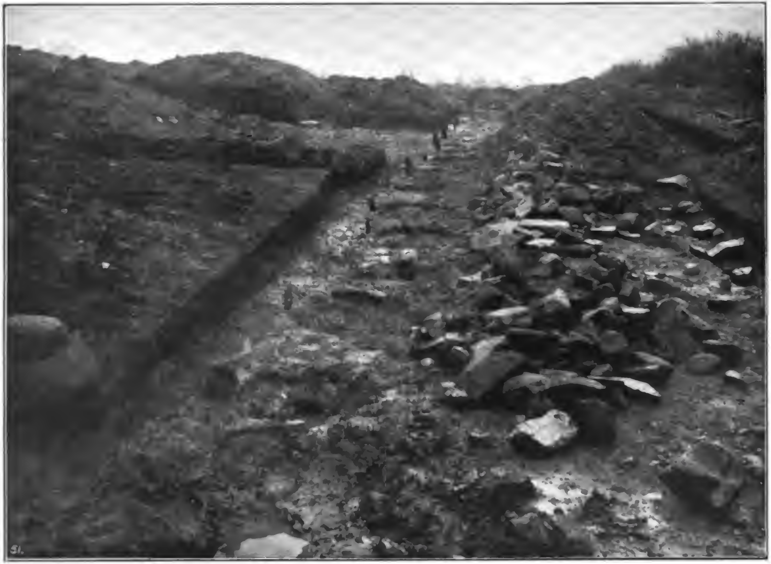

Fig. 21. Post-holes in front of Barrack Block No. V, with remains of Street, looking E.

and it might be anything from the kindling of signal-fires to the consumption of rubbish—it is odd that they should have been placed just where a westerly wind—the prevailing wind in the district—would drive the smoke straight on to the Praetorium and the blocks of barracks in the *retentura*.

The most remarkable of the fireplaces was, however, a circular recess, cut into the W. side of the outer ditch, 21 feet N. of the W. gateway, and walled with solid masonry. A good idea of its appearance is conveyed by fig. 22. The floor was of boulder clay, and on the same level as the bottom of the ditch. The dimensions were as follows :—

| | |
|---|---|
| Diameter above scarcement . . . . . . | 7 feet. |
| Diameter below scarcement . . . . . . | 5 feet. |
| Width of scarcement . . . . . . . | 1 foot. |
| Height to scarcement . . . . . . . | 3 feet 3 inches. |
| Height (surviving) above scarcement— | |
| (*a*) on S. side . . . . . . . . | 1 foot 10 inches. |
| (*b*) on N. side . . . . . . . . | 10 inches. |
| Width of furnace opening . . . . . | 1 foot 8 inches. |

Beneath the line of the scarcement the recess contained a large quantity of red ashes, above which were loose stones and soil. Ashes of a similar character were lying in abundance in the ditch outside; they had evidently been drawn from the fireplace, when it was in use. It should be added that the mass of loose stones was so considerable as to show that the building had originally been much higher.

One's first impulse is to regard the circular recess as an oven. Four ovens were found in the body of the rampart at Birrens,[1] and a like number at Inchtuthil.[2] Or the red ashes might suggest that it had been a kiln for drying bricks or tiles.[3] There are serious difficulties in the way of both of these views. It would be strange indeed if the garrison had been dependent for the baking of their daily bread on an oven to which no access could be had except by going outside the defences. On the other hand, had it been a kiln, one would have expected to find fragments of bricks or tiles or pottery among the debris. Such fragments were conspicuously absent, and the redness of the ashes may well have been due to the dye-stuffs from the wood that served as fuel. Again, the ruins, considerable as they were, furnished no evidence that flagging had been laid across the scarcement, no sign of the usual provision having been made for draught and for the smoke from the fire. These last objections are not perhaps insuperable. Flagging and the stones of a dome might quite well have been carried away by those who plundered the site for building material. Or the kiln might have been

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[1] *Proceedings*, 1896, vol. xxx. p. 101.

[2] *Proceedings*, 1902, vol. xxxvi. pp. 209 ff.

[3] For kilns near the S. gate at Amboglanna, Aesica, and Housesteads, see *Arch. Ael.*, xxv. pp. 282 ff.

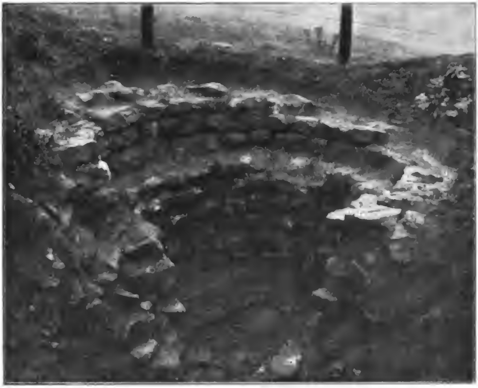

Fig. 22. Circular Recess for Fire in side of Outer Ditch on W.

used for drying corn, in which case the fire would be a smouldering one, so that the top would be left open, and planking might suffice as a bridge.

Against all these suppositions there is one most powerful argument—the intense degree of heat to which the whole recess had been subjected. The actual furnace was large out of all proportion to what would be required for a kiln or oven of similar dimensions, and the stones that formed the wall were burned red, deep below the surface. In these circumstances, a suggestion that originated with Mr M'Intosh deserves to be carefully weighed. His view is that the recess was employed for cremation—that it was, in fact, the *ustrinum* of the fort. He supposes that the fireplace below the scarcement would be piled up with dry fuel, and that the body would then be lowered on a strong hurdle of green wood, the ends of which would rest upon the ledge provided by the scarcement. It will be noted that the diameter (7 feet) suits this hypothesis exactly. The fire would be kindled and fed from beneath, and the hurdle would support the body until it was wholly consumed. It is a matter for regret that it was not found possible to test this theory by having specimens of the ash microscopically examined. An opportunity for that may occur elsewhere. In the meantime it is worth pointing out that, if cremation was to be effective, some such system as has been described would be essential. A body would not be consumed by being merely thrown upon a blazing fire. Nor is there much force in the objection that a *ustrinum* in such close proximity to the fort would be offensive. The walls, be it remembered, were high. If the fire were fierce and the consumption rapid—as it would be in such circumstances—no smell would be observable. Except when the fire was freshly lit, there would be little or no smoke. Besides, we have already found great hearths much nearer to the soldiers' quarters.

(*i*) *Refuse-Holes.*—Within the ramparts of the fort the excavators discovered nine rubbish-pits or refuse-holes, all of which were thoroughly examined. The position of each will be found marked upon the Plan

(Plate II.). It will be observed that one of them lay within the area of the early fort, and a second on the line of the early ditch, while the rest were entirely clear of the Agricolan enclosure. As we shall see presently, their arrangement distinctly suggests that the whole group belongs to the Antonine period. The main facts regarding them are embodied in the following descriptions:—

*Hole No. 1* lay in the N.W. corner of the *praetentura*. It must have been close to the western end of Barrack Block No. I. Circular in shape, it had a diameter of 18 feet at the mouth, as against 5 feet at the bottom. The depth was 15 feet. Stakes of oak and of mountain ash had been driven in all round it, evidently to support the sides. The contents consisted of 2 feet of soil and stones next the surface, 2 feet of ashes, 8 feet of decayed vegetable matter, and 3 feet of soft clay and large boulder-like stones. Mixed with the vegetable matter were bones of animals, boots, pieces of red-deer horn, broken pottery, bits of wrought wood, a 'first brass' coin of Trajan, and sundry fragments of metal. Eleven of the bones proved to be human—all either of hands or of feet.

*Hole No. 2* lay in the eastern half of the *praetentura*, about 10 feet to the rear of the line of the S. wall of Barrack Block No. II. Like Hole No. 1, it was circular, the diameter being 15 feet at the mouth and 5½ feet at the bottom, while the lip was protected by a stone kerb, 6 inches deep, running all the way round the edge. When it was cleared, 5 feet of stones and soil, 12 feet of decayed vegetable matter, and 5 feet of soft clay gave a total depth of 22 feet. The vegetable matter contained many bones, boots, and pieces of leather, besides pottery and other relics. The circumstance that for the last 5 feet of their course the sides were perpendicular suggests that the hole was originally meant for a well. If so, the large quantity of soft clay in the bottom possibly explains why the project was abandoned; it may indicate that the upper portion of the sides had slipped.

*Hole No. 3* lay due W. of the southern portion of the Praetorium. It formed a rectangle 6 feet long by 5 feet wide, with a depth of 6 feet. A quantity of ashes was found near the surface. Beneath these came stones and soil. The relics were very few in number. A noteworthy feature was a stratum of coal, 6 inches thick, which covered the bottom. The pieces of coal were very small, the greatest dimension of the largest being only about an inch.[1]

*Hole No. 4*, which was likewise rectangular, lay in the *retentura*, close to the S.W. angle of the fort. It was 4 feet long, 3½ feet wide, and 4 feet deep. It contained about 2 feet of decayed vegetable matter, but yielded no objects of any importance.

*Hole No. 5* was also unfruitful. It was similar in shape to No. 4, which it closely adjoined. It was 5½ feet long, 4 feet wide, and 5 feet deep. The layer of vegetable matter was 2½ feet thick.

*Hole No. 6* was one of the most remarkable of the series. It was near the S. gate, on the western side of the street that ran thence towards the Praetorium. Its surface measurements were 14 feet by 6 feet, and it was 8 feet deep. In the 2 feet of soil that had first to be removed were several large sandstone flags. The 5 or 6 feet of decayed vegetable matter that followed contained the usual debris of pottery, leather, wood, bones, and the like, as well as a number of mussel shells. Then came a complete chariot wheel. Three long oaken stakes had been driven into the boulder clay of the bottom, one of them passing between two of the spokes of the wheel. It looked as if these stakes or posts had been intended to support the flagstones on the top.

*Hole No. 7* was 5 feet long, 4 feet wide, and about 5 feet deep. It lay directly opposite No. 6, on the other side of the street already mentioned. The decayed vegetable matter with which it was filled contained nothing that calls for special mention. Near the surface was one of the capitals from the colonnade round the open court of the Praetorium.[1] It had been broken, probably by the plough.

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[1] It may be mentioned that there is a coal outcrop in the immediate neighbourhood, about 150 yards to the E. of the Castle Hill. It is hardly more than 4 inches thick at the surface.

*Hole No. 8* was of exactly the same size as the preceding. It lay about 12 feet S. of the eastern end of the line of post-holes that marked the course of the S. wall of Barrack Block No. IV. Beneath 2 feet of soil and stones was a stratum of vegetable matter 3 feet thick, containing boots, bones, and so on, as well as a few oyster and mussel shells much decayed.

*Hole No. 9*, which, like all the others in the *retentura*, was rectangular, lay just within the eastern rampart near the S.E. angle of the fort. It was 14 feet long, 7 feet wide, and 7 feet deep. At its northern end there were some indications of a built cover, the chief relic being a large flagstone, 4 feet long and 1 foot 8 inches wide. In the centre of this was a rectangular opening, 4½ inches by 4 inches. The hole itself contained 2 feet of soil and ashes, and 5 feet of decayed vegetable matter. Among the 'finds' were boots, bones, portions of red-deer horns, oyster shells, the greater portion of the shell of an egg—about the size of a hen's egg,—several birch brooms or 'besoms,' much worn, and a large sheet of leather rolled up, with a rope inside of it.

The general character of the pits just described hardly admits of question. They were neither more nor less than the ordinary 'middens' of the Antonine fort. The nature of their contents (with the single exception of the chariot wheel) accords completely with this supposition. And the same may be said of their distribution. The two large pits were intended to serve the blocks of barracks in the *praetentura*. One lay to the E., the other to the W. of the *Via Praetoria*. The six smaller ones in the *retentura* were divided in similar fashion between the two sides of the fort, and here again a connection with the barrack buildings seems certain. Attention may be directed to the manner in which the latter group is arranged, with some approach to symmetry, in relation to the neighbouring streets. In view of all this, the position of No. 3 may perhaps be regarded as confirming an opinion already expressed, to the effect that a dwelling-house—the residence of the commandant—had once stood to the W. of the Praetorium.[1] The sharp contrast that Nos. 1 and 2 present to the remainder is somewhat striking. They are very much larger, and they are circular in shape, not rectangular. It was suggested above that No. 2 was originally intended for a well.[2] Possibly No. 1 may also have been dug in quest of water; but the whole of the rest appear to have been specially prepared as receptacles for rubbish. Two points that call for remark in passing are, first, the probability that at least Nos. 6 and 9 had been provided with a covering of stone, and second, the occurrence of quantities of ashes near the surface of Nos. 1, 3, and 9. The latter feature may indicate that, after the holes had been filled, the refuse was thrown on the top and burned.

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[1] See *supra*, p. 39.

## V. The Relics.

The mass of relics recovered in the course of the excavations was of unusual extent and interest. Many of them came, as has been already stated, from the Well. The majority of the rest were extracted either from the refuse-holes or from the ditches. It is worth observing that, in the case of the ditches, by far the most prolific spots were the outermost corners.[3] The reason is not difficult to divine: it was only natural that it should be the parts furthest from the gates that were selected for the deposit of rubbish. The one exception proves the rule. The N.E. corner yielded absolutely nothing. And there was an obvious motive for keeping this clean. The Military Way skirts it closely, and the sight of broken crockery and cast-off shoes would have been offensive to the passers-by. The whole of the 'finds' are now preserved at Gartshore House, where they constitute a small museum, well worthy of study by those interested in Romano-British antiquities. The following brief description aims merely at providing a general account of each important class, together with a particular notice of a few of the more prominent objects.

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[1] See *supra*, p. 50.

[2] See *supra* p. 61.

[3] Mr Haverfield tells us he has noticed the same thing at other forts, *e.g.* at Chesters.

### *A. Pottery.*

(*a*) *Coarse Ware.*—The greater number of the very abundant potsherds are fragments of the coarse unglazed ware so common on Roman sites in Britain and elsewhere. This ware was evidently employed mainly for the larger vessels of ordinary household 'plenishing.' It varied a good deal in colour, from yellowish white to reddish or to ashen grey. Of the vessels in question the larger proportion were used for storage purposes. Among the Romans the chief storage vessels were the *dolium* and the *amphora*. Strictly speaking, these were measures of capacity, the former being a multiple of the latter. As a matter of fact, the terms appear to have been applied somewhat loosely to distinguish two different classes of vessel, irrespective of size. The dolium was globular in shape. Its leading characteristics were a wide mouth, with everted lip, and the absence of any considerable neck. The bottom was generally flattened somewhat, to give stability, and was frequently supplied with a substantial 'foot.' Dolia were sometimes of great size; the 'tub' of Diogenes, for instance, was a dolium (πίθος). The typical amphora, on the other hand, was ovoid rather than globular, and had a well-defined neck, flanked by two looped handles. Towards the bottom it narrowed so rapidly as to be incapable of standing upright without support. It was probably meant either to rest in a framework of some sort or to be buried a certain distance in the earth.

Broad as this distinction may seem to be, it is of comparatively little value as a working basis of classification when one is confronted with actual remains. There was so much variation of shape and form that it must always be doubtful where the dividing line is to be drawn. In dealing with the Bar Hill relics there is the added difficulty that the potsherds are for the most part too fragmentary to admit of reliable inferences being drawn as to the outlines and dimensions of the original vessels. All that can be said with certainty is that many sizes and several distinct types of storage jars are represented, some of them having two looped handles, some one, and some none at all.

Fig. 23 reproduces an almost perfectly preserved example of a class to which not a few of the fragments should undoubtedly be attached. This is the specimen recovered from the Well at a depth of 38 feet. It may fairly be described as an amphora. The 'find-spot' suggests that it may perhaps have been used to draw water in an emergency.[1] It is of a yellowish colour, stands 2 feet 6½ inches high, and has, at its widest part, an inside diameter of 18½ inches. The circumference round the outside of the lip is 20 inches, round the neck 13 inches, and round the widest part of the body 62½ inches. The walls vary much in thickness, the maximum being about an inch. They are of comparatively rude workmanship, showing no traces of the wheel, and would appear to have been moulded on the inside by the hand, and on the outside by the aid of a piece of wood. The neck and handles are much more carefully made, and have been attached subsequently while the clay was still soft.

Fig. 24, No. 1, shows the upper part of a jar of quite a different type. It is of yellowish clay, more finely wrought than is usual in the case of vessels of this size, and has evidently been made with the wheel. The outside diameter of the mouth is 5¼ inches, and the circumference of the neck is 13 inches. Close beside it (No. 2) is a curious fragment, also wheel-wrought, but presenting some rather unusual features. As placed in the illustration, it looks like a portion of a cylindrically-shaped jar.

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[1] Jacobi has already inferred that amphorae were occasionally employed for such a purpose (*Das Römerkastell Saalburg*, p. 421).

Probably that is what it really is. But, when laid upon its side, it has more resemblance to a piece of broken water-pipe. The material is of a greyish-yellow colour. The exterior surface is singularly smooth, but the interior is corrugated throughout its whole length with a series of circular ridges, the effect of which must have been to increase the power of resistance to pressure. The ridges are lower and less decided at the upper end, but become gradually more prominent as they descend. The

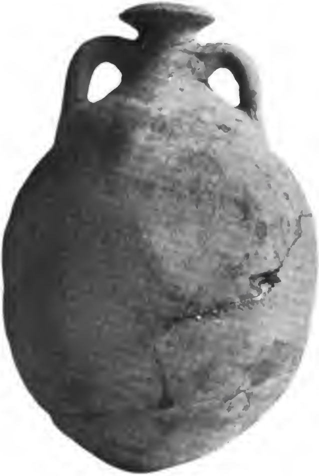


Fig. 23. Amphora from Well. ($\frac{1}{7\frac{1}{2}}$.)

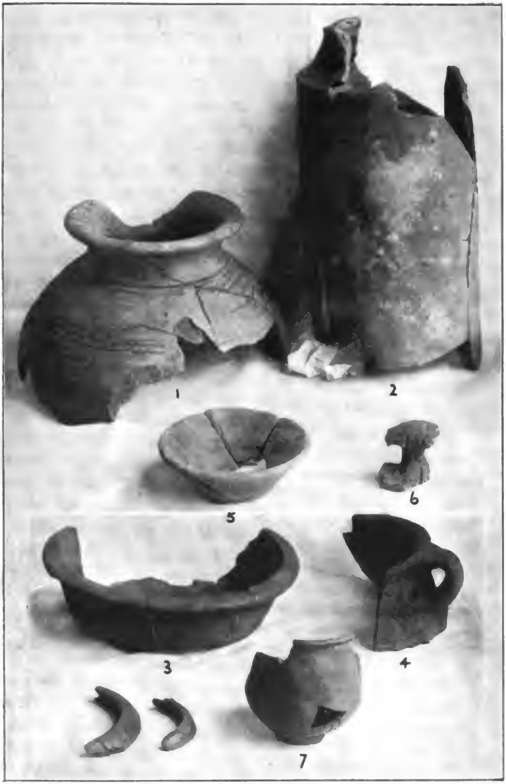


Fig. 24. Fragments of Pottery, Wooden Bobbin, etc.

walls thicken in similar fashion—a fact which is in itself conclusive against the view that it formed part of a water-pipe. The extreme height of the surviving portion is 11½ inches, and its greatest girth is 17 inches.

For the rest, storage vessels are represented mainly by a heap of disconnected fragments. Necks, mouths, and handles are very common. A few examples are given in fig. 26, Nos. 3–5. The frequent survival of these parts is due to their more careful and substantial make. Occasionally a handle or a mouth bears a potter's stamp or a mark, recording either the capacity of the vessel or the name of the manufacturer, or sometimes, possibly, the nature of the contents. Unfortunately, the heavy clay soil of the Bar Hill has had a prejudicial effect on the legibility of these inscriptions. One amphora shows distinctly X and X on opposite sides of its everted lip, as well as what seems to be N on one of its handles. The remaining amphora marks are all more or less doubtful. Here is a list, hardly any letter in which is to be regarded as quite certain:—

| | |
|---|---|
| I.. SP. . . Q, | on handle. |
| GN·APCO, | ,, ,, |
| MMCCV, | ,, ,, |
| VIRA. | ,, lip. |

Slightly doubtful is also AII, scratched on a handle.

Apart from storage vessels, the coarser ware was mainly used for what are generally termed *mortaria* or *pelves*. The pelvis was a deep basin, not unlike a modern milk-pan. A special feature was the very large everted lip, pierced at one point by a grooved spout. The larger part of the inside surface was roughened by an admixture of small pebbles or pounded quartzite. The clay itself was harder and finer than that employed for many of the storage vessels. The colour varied. The Bar Hill fragments, which are fairly numerous, are either ashen-grey or decidedly red. A potter's mark was frequently placed on the lip. The following occurred at Bar Hill. It will be seen that several of them are uncertain.[1]

A conventional palm-branch.

ARI
- - - (?),

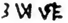
AVRII
MAN (?),

CICV (?),

CO- - -,

- - -RRI,

XCH,



In describing the corresponding fragments from Birrens, Dr Anderson has drawn attention to the fact that some of them presented a blackened exterior, and has suggested that these dishes must sometimes have been used for heating food.[2] Although nothing of the sort was observable at Bar Hill, ample evidence from other sites confirms his inference.[3] The roughened interior, however, supplies an unmistakable clue to the most ordinary purpose of the pelvis—the preparation of corn, fruit, or vegetables for the actual process of cooking. The broad rim was intended to provide a firm hold, while the spout was for draining off the water employed in cleansing or in softening during trituration.[4]

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[1] Mr Haverfield reminds us that many of the stamps on amphorae and pelves were probably 'bogus,' having no definite significance, but being merely intended to lend an air of general respectability to commonplace ware.

[2] *Proceedings*, 1896 (vol. xxx.), p. 183.

[3] H. B. Walters, *Ancient Pottery*, ii. p. 551.

[4] The probable method of use has been well explained by Jacobi (*Das Römerkastell Saalburg*, pp. 424 f.).

(*b*) *Finer Reddish Ware.*—Fragments of a somewhat finer reddish ware—varying in quality, but generally resembling that of which flower-pots are made nowadays—were also present in considerable quantities. The upper parts of two jars or vases afforded an interesting glimpse of the method of manufacture. After the body of the vessel was finished, but while the clay was still soft, the workman attached the mouth by thrusting the neck into an aperture left to receive it. He then inserted his finger, bent the lower part of the neck inwards till it united with the body, and finally rounded off the junction as best he might: the finger-marks can still be clearly seen. Last of all, the handle was added. On the average, the vessels of the 'flower-pot' ware are considerably smaller than those made of the coarser material already spoken of. A few specimens are covered with white or black colouring matter. In one instance a layer of black clay has been superimposed on a layer of red. No potters' stamps were observed on vessels of this class. But there are two *graffiti*—ƧEN on what may once have been the bottom of a jar, and Ӿ on a handle, the latter being probably an indication of capacity. A somewhat curious style of decoration is exemplified by a portion of a bowl. The outer margin of the everted lip is 'frilled' instead of straight, and about 1½ inches from the top there projects a circular band, the lower edge of which is also 'frilled.' Similar vessels have been found in London (now in the Guildhall Museum) and York, as well as at Caerwent and Gellygaer.[1]

(*c*) *Thin Black Ware.*—The familiar black ware is well represented. The colour, as displayed at the fractures, is by no means uniform, but varies from blue to grey. Sometimes it is actually red, a result of the hard burning process to which vessels of this class were subjected. Three main groups can be distinguished. The first, which is also the smallest, consists of storage vessels. The example here illustrated

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[1] *The Roman Fort of Gellygaer*, p. 79. Mr R. A. Smith informs us that a piece of grey ware from Silchester, now in the Reading Museum, is similarly decorated.

(fig. 25) stands 15¼ inches high. At its widest part the diameter is 12¼ inches. At the mouth the corresponding measurement, over the lips, is 6⅜ inches. The girth round the neck is 14 inches. The body is very simply ornamented by a few lustrous bands passing, at irregular intervals, round its upper part and round the neck. This vase was recovered in fragments from Refuse-Hole No. 2. The same spot yielded considerable portions of a second vase, evidently of very similar shape and dimensions. These were the most important remains definitely assignable to this group. But mention may also be made of some fragments of a smaller vase, where the decoration consisted of rows of small circular spots, apparently laid on with a self-coloured slip.

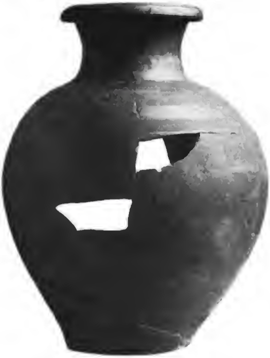

Fig. 25. Jar of Black Ware. (¼.)

The second group is composed of wide, flat-bottomed, platter-like dishes. These were of varying dimensions. A fine example, found quite uninjured in Refuse-Hole No. 2, is reproduced in fig. 26, No. 1. It has an outside diameter of 7¾ inches across the mouth, and of 6¾ inches across the bottom, inclusive of chamfer. Its depth is 1½ inches. The majority, however, have been smaller and deeper, closely resembling flower-pot saucers in their shape. See, for instance, fig. 24, No. 3. Occasionally the surface has been left perfectly plain, but often the exterior is ornamented with an arrangement of scored or burnished lines. Sometimes a single series of such lines runs transversely from top to bottom. More frequently two series cross each other diagonally, producing the impression of a network. Here and there we get a

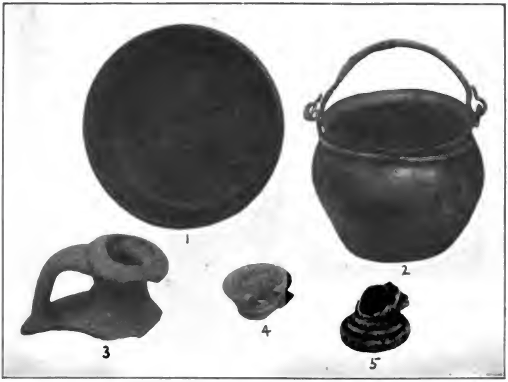

Fig. 26. Plate of Black Ware, Copper Pot, and Fragments of Coarse Ware.

departure from the normal pattern. In one case a set of deep scratches gives an effect of unusual crudity.

The third group is in some ways the most interesting. The vessels belonging to it may conveniently be termed *ollae*, for the thick coating of hard soot with which the fragments are covered makes it clear that they were cooking-pots. The method of decoration corresponds generally to that employed on the platter-like dishes. The *ollae* differ slightly in shape; but, taken as a whole, they may be described as having a narrow bottom, bulging sides, practically no neck, and a very wide mouth with a lip that turns rapidly downwards. The narrow bottom suggests that, when in use, *ollae* may have frequently been set into an iron framework that stood upon the cooking-hearth.[1] But one of the Bar Hill fragments proves clearly that sometimes at least they were suspended. This is a portion of a mouth, having attached to it a solid 'ear,' three-quarters of an inch long, pierced by a small hole. The greatest breadth of the ear is a quarter of an inch, and the diameter of the hole is one-sixteenth, just sufficient to admit a suspending wire. It may be added that suspension would be possible even without ears. The lip—as shown, for example, in fig. 27, No. 2—is usually sufficiently everted to allow an encircling wire to rest safely and comfortably in the groove beneath it. To this would be added a second wire arched over the top of the *olla*, much as in the case of the bronze pot illustrated in fig. 26, No. 2. The second wire would serve also on occasion as a handle. Handles of any other sort, it should be explained, occur but rarely on vessels of this type. That they had a value where they did exist is shown by the fact that an ear-shaped open handle (fig. 24, No. 4) has been carefully mended in the same material. Another piece of an *olla* has three small holes, evidently for lead clamps.

(*d*) '*Samian*' *Ware.*—Fragments of red 'Samian' ware are numerous. As a rule, they are in poor condition, the heavy, wet clay having made sad havoc of the lustrous surface. The drinking-cup of fig. 24 (No. 5) gives a good idea of the extent to which much of this ware has suffered. The fine plate represented in fig. 27 (No. 1) has, however, lost little of its original brilliance. It was found broken, but practically complete, in the S.W. corner of the outer ditch. The diameter is 11 inches, and the inside depth 2 inches. In the centre is the stamp **BELINICIM.** The remaining fragments present no features of special interest. They are portions of cups, plates, and bowls of the normal shapes and sizes. The bowls display the usual style of ornament—the 'egg and tongue' border, hunting scenes, foliation, and the like. Some progress has recently been made in the direction of a chronological classification of Samian ware.[1] A careful scrutiny of the

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[1] See Jacobi, *Das Römerkastell Saalburg*, p. 242, for illustration.

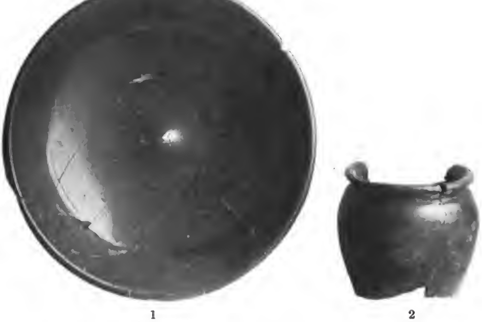

Fig. 27. Plate of Samian Ware, and Pot of Black Ware. (⅓.)

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[1] Koenen, *Gefässkunde* (1895); Dragendorff, *Bonner Jahrbücher* (1895, etc.); Déchelette, *Les Vases céramiques*, etc. (1904).

pieces from Bar Hill has failed to disclose any that bear characteristic signs of being 'early.' In addition to the stamp already mentioned, the following makers' names occur:—

AVITVSF,
CALV---(*?*),
DIVICATVS,
GEN[*IALIS·F?*],
MALLVROF,
*PE*]CVLIARISF,
T---,
VA---,
---ΛRO(*?*),
---VSF.

These are on the inside in every case. The following, all representing the same name (*Cinnami m*[*anu*]), are on the outside:—

MIMAИИIↃ,
---И⊦---,
---4И---,
CIИ---.

The whole of these marks, so far as they are certain, are of more or less common occurrence elsewhere. Three pieces of Samian have letters scratched upon their outside surface. One of these reads **GLH**. Each of the others has **VI**.

(*e*) ***Miscellaneous Fragments, etc.***—There remain a certain number of potsherds which cannot conveniently be classed under any of the four heads already dealt with. There are, for example, about half a dozen fragments of vessels of 'Castor' ware. They are of the usual dull slate colour, with a coppery tint. The majority are ornamented with conventional foliation, but one piece shows the legs and part of the body of an animal. In all cases the decoration has been laid on in 'barbotine' with self-coloured slip. Fig. 24, No. 7, shows an interesting little drinking-cup of fine clay, now reddish in colour, but possibly once black. From the N. ditch, where it passes in front of the Baths, there were collected (as has been mentioned above)[1] numerous portions of small vases or bottles, of different qualities of clay, often reddish in colour, and occasionally bright red. The shapes vary somewhat. One of the most complete seems to have been originally about 4 inches high, with a maximum outside diameter of 2½ inches, narrowing rapidly to a small solid 'foot.' In another instance the surface has been granulated by an admixture of gritty particles which appear to have been dusted on while the slip was still moist. This device would enable the vessel to be held securely even by oily fingers. A third piece, with a diameter of 1¾ inches, looks like a lid or cover. The most remarkable, however, is the lower end of a small vase which has been covered with bright enamel on the inside and on the upper part of the outside. The bottom and the lower part of the outside are coloured a deep, rich bronze. The general character of these vessels has already been interpreted as suggesting that they were originally used to hold unguents or similar toilet requisites.[2] Green glazed ware was represented by several fragments, three of them of reddish clay. Mention should also be made of the bottom of a jar, about 2 inches in diameter, pierced with four holes, for use as a sieve or strainer. It recalls a somewhat similar but decidedly larger article from Castlecary.[3]

A few miscellaneous objects of clay have still to be enumerated. A lamp of the ordinary form was found in trenching the ground between the N. ditch and the Antonine Vallum. Its greatest length is 2¼ inches, inclusive of the mouth but exclusive of the handle, which is missing. It bears no ornament or stamp of any kind. A solid lump is curious as showing the distinct impression of two human fingers. In shape it has some resemblance to the rude outline of a lamp. A small crucible was recovered from the N.W. corner of the outer ditch. It is

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[1] See *supra*, p. 46.

[2] See *supra*, p. 46.

[3] *Proceedings*, 1903 (vol. xxxvii.), p. 335, fig. 34.

1½ inches in diameter, exclusive of spout, and has an inside depth of 1½ inches also. Six little balls or marbles of clay from Refuse Hole No. 6 are much too light to be sling bullets. They average about ½ inch in diameter, and have been rolled with the hand and burned red. They are probably children's playthings. Lastly, there are a number of 'counters' or discs, fashioned out of broken pottery, such as are often turned up on the sites of Roman forts. It is generally agreed that they were used in some game. A few have holes in the centre, like spindle-whorls.

### *B. Tiles and Remains of Floors.*

Broken tiles were fairly numerous. The flange on the edge of some indicated that they had been used for roofing purposes. Red roofs, therefore, fall to be added to the details that go to make up our mental picture of the original aspect of the Antonine fort. They would be doubly conspicuous as exceptions, for the wooden buildings, which occupied so large a portion of the area, were in all probability covered with thatch. Other tiles had obviously been intended for flooring or for use on walls and in flues. No stamps were observed on any of them; but scored lines—possibly 'keys' for plaster—were not uncommon, there being generally two sets crossing each other either diagonally or at right angles. One tile was marked with a circle.

A small, flat, perfectly diamond-shaped piece of black composition, ¼ of an inch in thickness, would appear to have belonged to a mosaic. It was found in the Well. From the N.W. corner of the outer ditch came a little bit of flooring brick overlaid with cement on both sides, and having four holes for inlaying. Its original dimensions were ¾ of an inch thick by 1¾ inches broad by at least 2¾ inches long. More interesting still is a fragment of flooring—measuring 1¾ inches by 1¼ inches across the top, and square cut on two sides—from the short ditch on the E. side of the fort. It is in three well-defined layers. The bottom consists of very fine concrete about 1⅜ inches thick. Above that is ⅜ of an inch of glass, and above the glass is ⅛ of an inch of cement. The three are fused into a solid mass, and the whole gives evidence of excellent workmanship. This would form a most enduring material and an absolutely dry pavement. These remains suggest that some of the apartments within the fort had been elaborately floored. But their very rarity proves that such an arrangement was far from being usual. Clay or tiles must have been much more common.

### *C. Glass and Glass Paste.*

The relics include about fifty fragments of bottle glass. So far as can be judged, the bottles have all been of the ordinary square form. The majority have had smooth sides, but at least one has been fluted. Reeded handles have been the rule. The sizes were no doubt various. An uninjured bottom is 2¾ inches square. A mouth still entire, with neck and reeded handle, has from lip to lip an outside diameter of 2½ inches, and an inside diameter of 1⅛; the width of the handle is 2¼ inches, and its height 1¼. The colour is generally a bluish green, but three pieces of perfectly clear bottle or jar glass were recovered from the refuse-holes. Taken as a whole, the bottles have been strong and substantial. Probably they were imported along with their contents. At the same time, the manufacture of glass was certainly carried on inside the fort. Many small lumps of glass slag were picked up within the area of the workshops. It may well be that the glass for the windows was home-made. Of window-glass there are about thirty fragments, the largest of which measures 5 inches by 3½. One side is invariably obscure, showing that the sheets were run on a slab. The average thickness is about ⅛ of an inch, and the usual tint is a well-marked bluish green. There is, however, one little piece of a whitish colour, about $\frac{3}{16}$ of an inch thick.

Personal ornaments of any kind are very few in number. But a smooth and peculiarly elongated bluish bead of vitreous paste has evidently been strung on a necklace. It is quite unlike the usual ribbed and melon-shaped bead of glass paste or earthenware which one is accustomed to associate with the Romano-British period. The latter type is represented by five specimens, all of the same greenish colour. The largest is ⅜ of an inch high, and has a transverse diameter of ½ an inch. An oval piece of porcellanic paste, pink in colour, has evidently dropped from a setting. Its greatest length is ½ an inch, and its greatest breadth $\frac{5}{16}$. Its upper surface is slightly rounded. Beneath, it is quite flat but has a bevelled edge.

### *D. Stone.*

(*a*) *Inscribed Stones.*—The excavations added two to the list of Roman inscriptions found in Britain. Both of these were discovered in the Well. The altar reproduced in fig. 28 is of the ordinary form, and has the usual basin-shaped depression on the top. It was uninjured but for a fracture at the lower right-hand corner. The total height is just over 3 feet, 9 inches being given to the moulded base, 18 to the 'die,' and 10 to the cornice or 'capital.' Measured across the front, the lowest plinth of the base and the topmost tier of the cornice have each a width of 17 inches. In the case of the die, the corresponding dimension is 15 inches at the bottom and 14¾ inches at the top, while at the latter point the depth from front to back is 14 inches. The inscription, which is clearly cut in letters about 2 inches long, reads as follows:—

COH·I̅·
BAETASIOR
·C·R·

The interpretation is of the simplest. "*Coh(ors) prima Baetasior (um), c(ivium) R(omanorum)*" can only mean "The First Cohort of the Baetasii, Roman citizens, [erected this altar]." But to whom did they erect it? The absence of the name of a divinity is at first sight puzzling. It ceases to be so, if we remember that the 'find-spot' was within the precincts of the Praetorium. Doubtless the altar had stood in the *Sacellum*. Such a setting would of itself suffice to show its significance.

Its very presence in the shrine would imply a direct connection with the god who was held in highest honour there. If the object of dedication had been expressed in words, it might have been (as it frequently

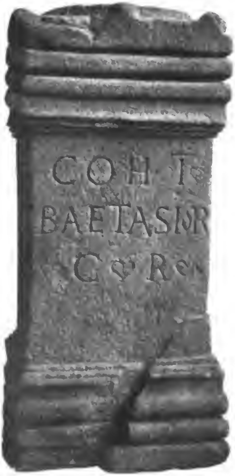

Fig. 28. Altar from the Well. (⅙.)

is) "*I(ovi) O(ptimo) M(aximo).*" Or the reference might have been to the imperial cult in its military aspect; "*Discip(linae) Aug(usti)*" is the legend on the altar from the well of the Praetorium court at Birrens,[1] while an altar found in the cellar beneath the *Sacellum* at Bremenium reads: "*G(enio) d(omini) n(ostri) et signorum.*"[1]

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[1] *Proceedings*, vol. xxx. (1896), p. 131.

The second of the two new inscriptions was incomplete. It had been cut upon a slab which must originally have been about 3 feet long by 2 feet high. Although more than half of it has perished irretrievably, the three fragments that survive (fig. 29) enable the whole to be restored with practical certainty (fig. 30). The only line that presented any difficulty was the last, and even here the missing letters were

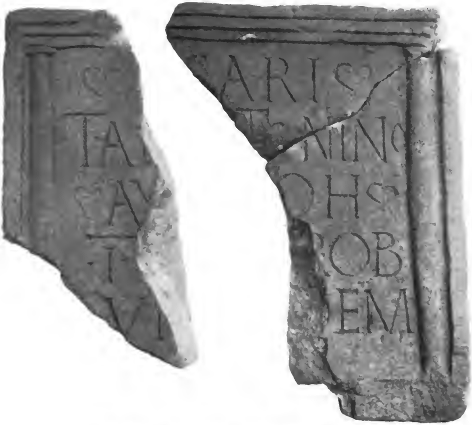

Fig. 29. Fragments of Inscribed Tablet. (¼.)

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[1] *C.I.L.*, vii. 1030. *Cf.* Bruce, *Roman Wall* (1867), p. 318.

speedily supplied.[1] Had the stone been found entire, it would have read somewhat as follows :— [2]

·IMP·CAESARI·
T·AEL·HAD·ANTONINO
·AVG·PIO·P·P·COH·
$\overline{\text{I}}$·BAETASIOR·C·R·OB
VIRTVTEM·ET·FIDEM

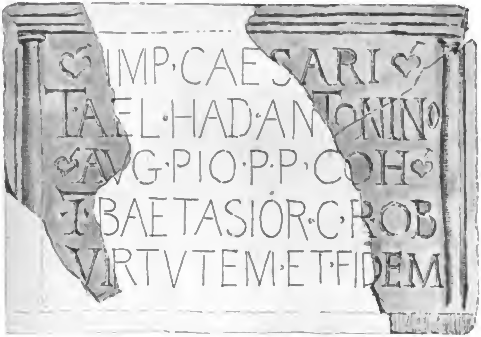

Fig. 30. Inscribed Tablet restored. ($\frac{1}{6}$.)

"The First Cohort of the Baetasii, made Roman citizens for their valour and loyalty, [erected this] in honour of the Emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country."

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[1] By Mr Haverfield in *Athenaeum*, No. 3980 (Feb. 6, 1904), pp. 184 f.

[2] Possibly there was another line consisting of one word in small letters. '*Appellata*,' which must either have been expressed or understood, is probable. Mr Haverfield informs us that such an addition would be quite in second century epigraphic style.

The analogy with Birrens holds good once more. If less elaborate in form, the inscription is of exactly the same class as that upon the large tablet from the Dumfriesshire 'station' with the name of the Second Cohort of the Tungri.[1] And the 'find-spot' is also the same. Closely akin is the stone set up by the Sixth Cohort of the Nervii at Rough Castle.[2] In all three cases the remains were discovered in the front court of the Praetorium. We may safely conclude that a similar slab occupied a prominent position in the corresponding quarter of all the second century Roman forts in North Britain. It recorded the name of the corps that had formed the original garrison.

Under the Empire it was a recognised principle of army administration that the frontier posts should be defended, not by the legionaries, but by the less costly levies known as auxiliary cohorts. The particular cohort mentioned in the new inscriptions had originally been recruited among the Baetasii. This people probably had their permanent home somewhere about the mouths of the Rhine, near the borderland where Celt and Teuton met. To which of the two stocks they belonged it is impossible to say. The sum of our information regarding them amounts to little more than that they were neighbours of the Tungri and the Nervii, and that they were among the tribes who took part in the great revolt of Civilis.[3] We have clearer ideas as to the history of the unit they contributed to the Roman army of occupation in Britain. Military diplomas of the years 103 and 124 A.D. prove that the First Cohort of the Baetasii was in the island at least as early as the beginning of the second century.[4] They must have lain for some time at Uxellodunum (Ellenborough, near Maryport), close to the western end of Hadrian's wall, for their presence there is attested by no fewer than five inscriptions.[5]

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[1] *Proceedings*, vol. xxx. (1896), pp. 128 ff.

[2] *Ibid.*, vol. xxxix. (1905), pp. 470, 472.

[3] Pliny, *Nat. Hist.*, iv. 106; and Tacitus, *Hist.*, iv. 56 and 66.

[4] *C.I.L.*, vii. 1193 and 1195.

[5] *C.I.L.*, vii. 386, 390, 391, 394, and 395. They do not, however, appear to have formed the regular garrison of Uxellodunum. The *Cohors Prima Hispanorum, Equitata*, was there under Hadrian, and was still there in the time of the *Notitia*.

We learn now that, when Lollius Urbicus fortified the isthmus of the Forth and Clyde, they were moved up to Bar Hill. Whether they returned to Uxellodunum, after the Vallum of Pius was abandoned, we have no means of knowing. But fully two hundred years later we get a glimpse of them confronting danger from another quarter. The *Notitia* gives their station as Regulbium (Reculver), on the Saxon Shore.[1]

The Baetasii are not the only auxiliaries whose name is associated with Bar Hill. In 1895 there was found in the Castle Hill Park, as already mentioned, an altar dedicated to Silvanus by Caristanius Justinianus, Praefect of the First Cohort of the Hamii.[2] With this must be connected an inscription seen near Kilsyth in the sixteenth century, but long ago lost. It was a tombstone bearing the name of C. Julius Marcellinus, Praefect of the First Cohort of the Hamii.[3] The Hamii, then, were also at Bar Hill. But the epigraphic evidence throws no light on the question as to whether they relieved the Baetasii there, or whether the cohort, or a detachment of it, was employed to strengthen the original garrison, either during the whole period of occupation or at some crisis when the pressure on the line of the Vallum was exceptionally heavy. The latter supposition perhaps derives some support from the fact that the Hamii, who probably came from Syria,[4] were soldiers of a special class. They were bowmen, as we learn from the descriptive epithet *sagittarii*, applied to them in one of several inscriptions that prove them to have been stationed for a time at Magnae (Carvoran) on Hadrian's Wall.[5]

At this point it will be convenient to notice shortly the only remaining inscriptions that can with reasonable probability be assigned to our fort. They number three in all. An altar dedicated to Mars Camulus, and now in the Hunterian Museum, was catalogued by Hübner under

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[1] *Not. Dign. Occ.*, xxviii. 18.

[2] See Haverfield in Glasgow Arch. Society's *Antonine Wall Report*, pp. 153 ff. The stone was presented to the University of Glasgow by Mr Whitelaw, and is now in the Hunterian Museum.

[3] *C.I.L.*, vii. 1110.

[4] *Antonine Wall Report*, p. 155.

[5] *C.I.L.*, vii. 748. *Cf. ibid.*, 1195.

Westerwood. It is much more likely that it belongs to Bar Hill.[1] The two others are lost. They were both on stones that appear to have been erected by legionary detachments in honour of the Emperor Antoninus Pius. One, a part of a pillar, was seen by Gordon "at Barhill fort," and subsequently passed into the collection of Baron Clerk.[2] Its fellow was built into the wall of the garden of a manor-house near Kilsyth.[3] Mention may also be made of two altars from Bar Hill seen by Gordon at 'Achenvole' House, and figured by him in the *Itinerarium* (Pl. 13, 1 ff.). One was of a commonplace character. The other was noteworthy for "several remarkable Figures engraved upon it, having a *Corona Triumphalis*, with an Inscription in the Middle, which is now defaced. Upon one side is engraved in *Relievo*, a *Quiver* full of *Arrows*; upon the other side an *Arcus* or *Bow*."[4] The bow and quiver remind us of the Hamii.

(*b*) *Sculpture.*—The architectural remains will be discussed below in a special Note by Mr Ross. Apart from these and from the inscribed stones, the main interest attaches to four rude pieces of sculpture, executed in native freestone (fig. 31). Though they are placed together in the illustration, they were found in widely different quarters of the fort—No. 1 in the S.E. corner, close to Refuse-Hole No. 9; No. 2 in the N.E. section, 36 feet W. of the inner kerb of the E. rampart, and 12 feet S. of the inner kerb of the N. rampart; and Nos. 3 and 4 to the N. of the Storehouse, on the lines, respectively, of the inner and outer Agricolan ditches. It is a remarkable fact that each of the four was discovered lying among the ashes of a rudely constructed hearth.

No. 1 is 11½ inches high and has a maximum breadth of 12½ inches. It represents the bust of a man in the act of raising to his lips a drinking vessel held in both hands. The attitude is unmistakably reminiscent of the squatting Silenus as figured in certain ancient works of art.[5] And the identification thus suggested receives strong support from more detailed observation. The face is entirely gone. The back part of the crown of the head, however, remains, and round the lower

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[1] See James Macdonald, LL.D., *Roman Stones in the Hunterian Museum*, p. 69.

[2] *C.I.L.*, vii. 1109.

[3] *C.I.L.*, vii. 1110*a*.

[4] *It. Sept.*, p. 55.

[5] See, for example, S. Reinach, *Répertoire de la Statuaire grecque et romaine*, ii. p. 59.

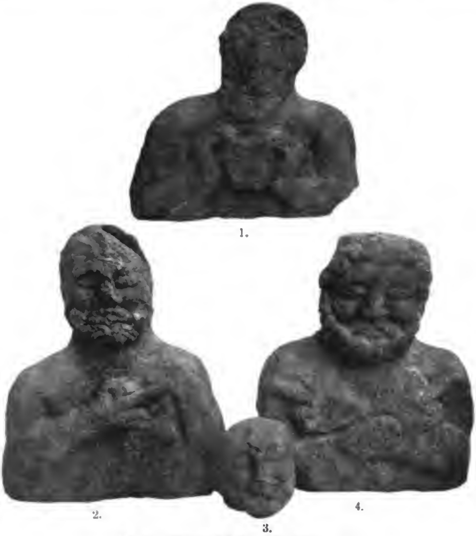

Fig. 31. Busts and Head of Freestone. (¼.)

part of this there runs a well-marked ridge, which is clearly intended for hair. The bust, therefore, was bald, as statues of Silenus so often are. The baldness is of importance from another point of view. It furnishes a direct link of connection between No. 1 and No. 3. The latter is a bearded head, 5 inches high by 4 inches broad, evidently a fragment broken from a larger whole. It has the same bald crown as No. 1. Here, however, the ridge is traceable all the way from the front. Above the temples it is so prominent that it can be distinctly made out in the illustration. In spite of the smaller size of No. 3, we cannot doubt but that, when complete, the two pieces of sculpture just described have formed a pair.

Such a correspondence is precisely what the obvious relation between the two remaining pieces might have led us to expect. That Nos. 2 and 4 were intended to be a pair, stands in no need of demonstration. While they differ slightly in size, they are very similar in character. No. 2 is 15 inches high and 11 inches broad; No. 4 is 14 inches high and 12½ inches broad. Each presents a bearded bust, with arms crossed over the chest. In the case of No. 2, however, only one of the arms has actually been chiselled. All three hands show the middle finger thrust boldly out from a closed fist. One meaning of this peculiar gesture is familiar to students of Latin literature.[1] But the *infamis digitus* had another significance. Like the *phallus* itself, it was a potent charm against the evil eye; and in this we may perhaps find a clue to the real character of the busts. So far as they were not merely ornamental, they may have served the same general purpose as the phallic symbols that the traveller of to-day sees here and there projecting above the doors of houses in Pompeii. Each of them has been carefully squared on the bottom, as if to stand upon a pillar or pedestal. The pillars or pedestals may have flanked the entrances to some of the public buildings, possibly the Storehouse, which must have had more than one door, and in connection with which the figure of Silenus would be peculiarly appropriate.

(*c*) *Miscellaneous.*—Quantities of other stones of different shapes and sizes, picked up at various points within the fort, bear evidence of human handiwork. Fragments of the so-called 'Andernach' stone have obviously belonged to querns. But all the grinding stones were not made of this material. Two of common freestone were found complete, one of them broken in half. These last are respectively 14 and 15 inches in diameter, with a thickness of 3½ and 3 inches at the centre. Towards the edges they become considerably thinner. Of sharpening-stones there are at least fifteen. A number of flat discs, cut for the most part out of freestone, suggest a homely game like quoits rather than the athletic exercise of *δισκοβολία*. They are about ¾ of an inch thick, and the diameter is generally about 5 or 6 inches, although in one instance it falls as low as 3½. Fig. 32 shows a characteristic group of miscellaneous stone objects, including a trough, what has possibly been a saddle-quern, and the remnants of three great mortars. Mention must also be made of more than a hundred stone balls, doubtless chiefly ballista balls. They vary in diameter from 8 inches to 1 inch, pointing to the use of engines of very different degrees of power. As was stated above,[1]

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[1] Mayor's note on Juvenal, *Sat.* x. 53, contains all the more important references.

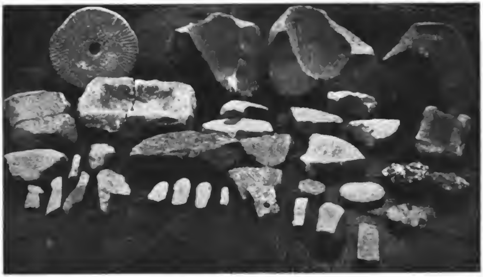

Fig. 32. Miscellaneous Group of Stone Objects.

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[1] See *supra*, p. 21 and p. 32.

the artillery was almost certainly mounted on the ramparts. We may add here a reference to the three blocks of stone turned up by the plough on the Bar Hill in 1895. They are figured and described in the Glasgow Archaeological Society's *Antonine Wall Report*, where it is conjectured that they may have formed part of the western gateway or of some building adjoining it.[1] They have holes for posts. The illustration in the *Report* also shows several diamond-brooched stones which undoubtedly belonged to the Bar Hill buildings. They were taken out of the modern dyke to the E. of the fort.

Two large lumps of jasper, as well as a good many smaller pieces, prove the presence in the fort of material for architectural decoration.[2] Another article of interest is the major portion of a palette of greenish slate. Its full breadth is 3 inches, and its length (incomplete) is 3$\frac{5}{8}$ inches. It is about $\frac{1}{4}$ of an inch thick. All round its under side the edge is bevelled to a depth of $\frac{1}{2}$ an inch. The upper side was originally flat, but it has been worn into a slight hollow by use. Similar palettes have been found elsewhere. A smaller one, made of marble, is now in the British Museum. It is from the King's Arms Yard, London. Another, also of marble, is figured by General Pitt Rivers.[3] A third, now in the Saalburg Museum, resembles the Bar Hill specimen in being made of slate, but is rather smaller. In describing it, Jacobi points out that it was probably employed for mixing salves or, it may be, unguents for toilet purposes.[4]

A curious relic is a piece of hard lime in which lies embedded what is apparently a mother-of-pearl button, $\frac{13}{16}$ of an inch in diameter, pierced with two holes. This was found 3½ feet below the surface, on the inner side of the rampart, immediately to the E. of the S. gateway. A little bit of cannel coal or oil shale, shaped somewhat like a slate-pencil, deserves passing notice. It is 1½ inches long, with squared sides, and is brought to a point at the top. It may well have been used for writing. On some surfaces it leaves a mark which is very distinct, but which can be easily obliterated by washing. The half of an armlet of shale also falls to be noted, as well as an object of the same material that is not unlike a coin-mould. The last-named was found in the Well. The circular depression is ⅛ of an inch deep, and has a diameter of ⅞ of an inch. There are faint traces of markings in the bottom; but these are too obscure to justify any expression of opinion as to what they represent. Finally, we may record a few small discs or counters seemingly of the same black composition as the *tessera* of mosaic already described.[1] One or two of them have holes in the centre. They should be compared with the similar objects made of broken pottery.[2]

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[1] *Op. cit.*, pp. 94 f. and p. 61.

[2] In this connection the following quotation from Fullarton's *Topographical, Statistical, and Historical Gazetteer of Scotland* (1842) is of some interest: "Specimens of yellow and red jasper were discovered [in the Kilsyth Hills] in 1791, or rather were then brought into notice; for the jasper, possessing a very fine grain, had even at that time found its way to the lapidaries and seal engravers of Edinburgh and London" (*op. cit.* vol. ii. p. 138).

[3] *Excavations in Cranborne Chase*, vol. i., Pl. xxi., 15.

[4] Jacobi, *Das Römerkastell Saalburg*, p. 453, fig. 71, No. 22.

### *E. Wood.*

The damp, which proved so destructive to the pottery, has exercised a kindlier influence on the vegetable remains. A twig of hawthorn got near the bottom of the Well looked as if it had been but a few months broken from the branch. From the same spot came the skin of a common 'puff-ball' (*scleroderma*). The preservation of the wood found nearer the surface was not, of course, so remarkable. But, taken as a whole, the quantity that survived was proportionately much greater than has been the case on other Roman sites excavated in Scotland. Before entering on a description of the actual objects, it will be of interest to give the names of the trees and bushes of whose presence indubitable traces came to light, sometimes in the shape of manufactured articles, sometimes through impressions of leaves, sometimes through evidence from roots or fruit or branches. The following were noted :—

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[1] See *supra*, p. 78.

[2] See *supra*, p. 78.

Alder
Ash
Birch
Elm
Hazel
Mountain Ash
Oak
Pine
Thorn
[Walnut]
Whin
Willow

(*a*) *Structural Fragments.*—Allusion has already been made to the stumps of posts found in the post-holes. They numbered considerably over a hundred, and were all of oak. Thirty pieces of the same wood were recovered from the Well. They varied in size from 9 feet long by 6 inches broad by 5 inches thick down to 1 foot long by 3 inches broad by 2 inches thick. Some of them are unmistakably charred with fire (fig. 33, Nos. 9, 12, and 13), an indication of the fate that overtook the fort when it was abandoned. All had probably been used for structural purposes, although the proof of this was plainer in some cases than in others. Fig. 33, No. 1, is a good illustration. With it may be classed a remarkable oak plank from Refuse-Hole No. 1. It is 3 feet 8 inches long by 7 inches broad by 1⅞ inches thick, and is perforated with seven square holes, ranged in line. The holes are each about 1¼ inches square, and the distance between them is 7 inches from centre to centre. The upper portion of the overhead beam of the Well, with cleft to admit the pulley, is clearly recognisable (fig. 33, No. 7). The part that has survived is about 19 inches long, the cleft being about 12 inches deep. Immediately above the cleft is a hole, 2½ inches in diameter, through which there must have passed a timber support of some sort. On the more complete of its two sides can be seen one of the small holes that received the ends of the axle of the pulley-wheel. Two pieces of the pulley itself were also found. Placed together as they are in the illustration (fig. 33, No. 10), they show that the original diameter was about 10 inches.

(*b*) *Wheels.*—Among relics that may be roughly called non-structural, the most conspicuous is a splendid specimen of a chariot wheel, dis-

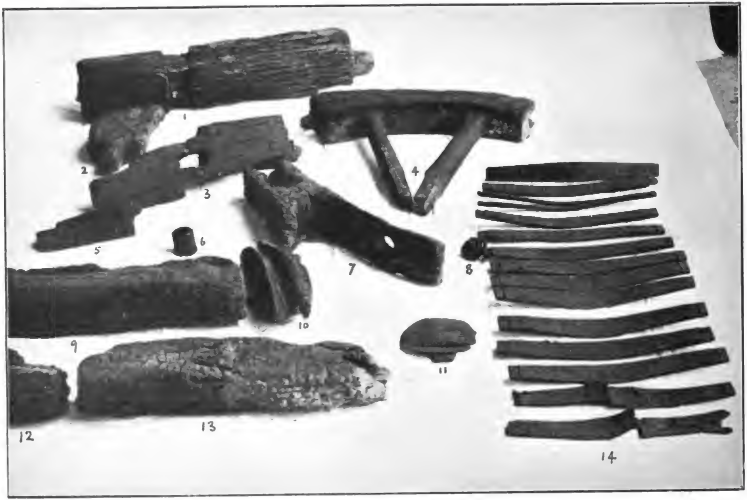

Fig. 33. Miscellaneous Group of Wooden Objects.

covered absolutely intact,[1] 8 feet below the surface in Refuse-Hole No. 6. Fig. 34 conveys a good idea of its general appearance, although it rather fails to give the full effect of the relatively large 'hub.' The outside diameter is 2 feet 10½ inches, while the nave measures 14½ inches from end to end, and has a diameter of 9½ inches at the centre and of 6¼ inches at the ends. The felloe, which is of ash, is formed of a single piece of wood, artificially softened and then bent into a circle; there is therefore only one joint, and the same grain runs all the way round. The spokes, which are of willow, are eleven in number. They are beautifully turned with the lathe, and are carefully tenoned into felloe and nave, the mortise-holes in the former being round, while those in the latter are partly squared. The whole is firmly bound together by the iron ring that forms the tire. The nave is probably of elm. Like the felloe, it is shod with iron, and is also 'bushed' inside with the same metal. The pattern of inlaid iron on either end of it seems to be purely decorative.

Remains of similar wheels have been found elsewhere. A nave with fragments of spokes was discovered at the pre-Roman Lake-Village near Glastonbury. When whole, the Glastonbury wheel must have had twelve spokes. The dimensions indicate that, all over, it had been slightly larger than the present example; the diameter, without felloe, had been 30⅞ inches. The nave, however, which was without iron or ornament of any kind, was smaller; its greatest length was 13⅞ inches and its greatest diameter 7⅞ inches. The various parts were lathe-turned and highly finished.[2] Portions of several wheels have also come to light at the Saalburg.[3] But even the most considerable of these is not nearly so well preserved as the Bar Hill specimen. It has only had ten spokes, and, as at Glastonbury, the felloe is awanting.

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[1] Unfortunately, in spite of every effort to raise it with the minimum of vibration, the spokes collapsed as soon as they lost the support of the ground.

[2] For these particulars we are indebted to the kindness of Mr Arthur Bulleid, the discoverer.

[3] Jacobi, *Das Römerkastell Saalburg*, pp. 172 and 447, with Tafel lxxx., No. 1.

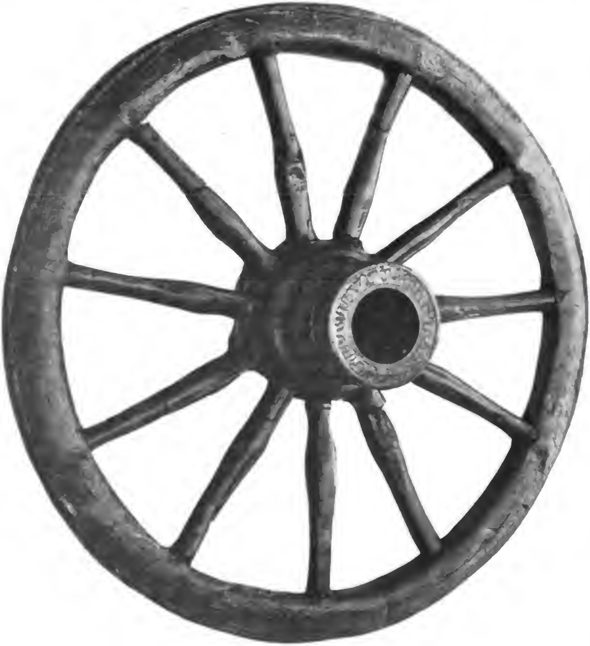

Fig. 34. Chariot Wheel. (¼.)

More important for purposes of comparison is a ten-spoked wheel found at La Tène, along with other remains of a chariot,[1] in the year 1882. This was considerably larger than any yet mentioned. Its outside diameter was 3 feet 2½ inches, while the nave was about 2 feet long. As can be seen from fig. 35, the La Tène wheel was inferior in finish to that shown in fig. 34. The nave was made of two symmetrically shaped halves which were held in place by iron hoops. The spokes were of oak (as they seem to have been at Glastonbury also), and of

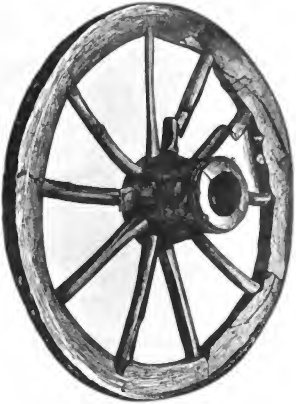

Fig. 35. Wheel from La Tène. ($\frac{1}{12}$.)

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[1] See Victor Gross, *La Tène, un Oppidum Helvète* (Paris, 1886), pp. 33 f.

comparatively rude workmanship. But the chief feature of interest is that here, as at Bar Hill, the felloe was entire, and that here too it was formed of a single piece of ash, bent. At one point there had been a fracture, which had been cleverly mended with a bit of iron and a nail. For the closest analogy of all, however, we must return to Scotland. The excavations now in progress (1906) at Newstead, near Melrose, have yielded two wheels, complete but for portions of the spokes. In their details they bear a very strong resemblance to that from Bar Hill. The main difference is the absence of the inlaid iron decoration on the ends of the nave.

This difference emphasises the superior make and style of the Bar Hill example. It is perhaps justifiable to conclude that the latter had belonged to a vehicle of more than usual importance. In any event its presence at the bottom of a refuse-hole is curious. Had it been worn and broken, there would have been an intelligible motive for throwing it aside. But the very reverse is the case. It must have been in the best of condition when tossed into its strange hiding-place. Why was it treated as a thing of nought? The possibility at once suggests itself that it may have been native, not Roman—the relic of an assault repelled or of some stricken field. The suggestion is one which, on its merits, it would be dangerous to push too strenuously. On the other hand, it forces us to ask: Is there any proof that the wheel is really of Roman workmanship? And to this the reply must, in the meantime, be in the negative. We may go further. There are indications that the burden of such proof would be heavy.

It is true that the Greeks, and *a fortiori* the Romans, were familiar with the process of curving wood to form the felloes of wheels. In one of his similes Theocritus introduces the picture of a coachbuilder who uses heat to bend the young branches of the wild fig-tree to his purpose.[1] Even in Homer there is possibly a hint of something of the kind.[2] But bronze enters largely into the construction of the actual remains of chariot-wheels discovered in Mediterranean countries—at Canino, at

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[1] Theocritus, *Id.* xxv. 247 ff.

[2] *Iliad*, iv. 485 f.

Perugia, at Toulouse.[1] All the wooden wheels cited above have been found in Northern Europe. At La Tène the association was entirely Celtic, and the Glastonbury Lake-Village is incontrovertibly pre-Roman.[2] Again, there is no ground for supposing that the Romans employed chariots in warfare, and Bar Hill was a military station. On the other hand, the war-chariot was, according to our literary authorities, a characteristic feature of the equipment of ancient British armies.[3] If we can trust Tacitus, Galgacus had a large contingent under his orders at the battle of Mons Graupius.[4] These are considerations of which account would require to be taken in framing a judgment. Meanwhile it hardly needs to be pointed out that, if one could assume a 'Caledonian' origin for the Bar Hill wheel, the resulting glimpse of the early civilisation of North Britain would be most illuminating.

Apart from chariots, wheeled vehicles were no doubt common enough in and about the fort. At Rough Castle few things were more striking than the deep ruts worn in the stones of the street that passed out of the southern gateway. They were eloquent of the continuous traffic that must have come and gone during the years of occupation. Bar Hill supplies a relic of the ordinary work-a-day waggons in which much of this traffic was probably carried on. Certain fragments from the N.W.

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[1] See Bromet, "Notices of the Remains of a Roman Chariot preserved in the Museum at Toulouse," in the *Proceedings of the Archaeological Institute* (*Oxford Meeting*), 1850, pp. 131 ff. For similar wheels found in Austria, see *Sitzungsber. der kaiserl. Akademie der Wissenschaften: Phil.-hist. Klasse*, Bd. vi. (Vienna, 1851), p. 282, Taf. xix.

[2] No tradition is more persistent than that which attaches to tools and to the methods of manufacturing articles of common use. In that light it is perhaps not without significance that to this day there are portions of the Russian Empire where the felloes of large wheels are fashioned in the precise manner exemplified at Bar Hill, at Newstead, and at La Tène. Several fine examples, with a diameter of fully 3 feet, are to be seen in the Glasgow Corporation Galleries at Kelvingrove. They were made in the Russian section of the International Exhibition of 1900. But we have not been able to ascertain from what district of Russia the makers came.

[3] See particularly Cæsar, *De Bell. Gall.*, iv. 33. The belief that the British chariots had scythes is much less well authenticated (Pomponius Mela, iii. 6, 52, and Silius Italicus, *Punic*, xvii. 417).

[4] *Agricola*, c. 35.

corner of the outer ditch enable us to reconstruct with tolerable certainty an entirely different type of wheel from that which we have been discussing. The fragments in question are all of oak. What they suggest is a twelve-spoked wheel, 3 feet 2 inches in diameter, in the construction of which no iron at all has been used. The felloe, instead of being formed of a single piece, has consisted of six distinct sections or 'treads,' attached to one another by wooden dowels. One such section, with the corresponding spokes, has been preserved entire; see fig. 33, No. 4. It is 19 inches long by about 2½ inches broad. The spokes measure rather more than 16 inches from end to end, and the inner extremity of each has been tenoned into the nave to a depth of 3 inches, while the outer extremity is driven right through the felloe and made to project a little way beyond its outer surface. The series of knobs thus produced served one of the objects of an iron tire. They helped to save the body of the felloe from the wear and tear of immediate contact with the ground. There was deliberate intention here, as is plainly shown by the presence of an additional knob just midway between the two ends of the spokes. The third projection is formed by a small dowel about 1½ inches long, driven into the outer side of the felloe. In the circumstances it is, of course, impossible to say whether the device was repeated in each tread all the way round, or whether it was merely a precautionary measure of repair adopted at a particular point which had begun to betray signs of weakness through usage. Considerable portions of the nave also survive (fig. 33, Nos. 2, 3, 5, and 11). From them we can estimate the original diameter of this part of the wheel at 12 inches, and can see that its construction was comparatively primitive. It was solid, and the axle revolved with the wheel.

(*c*) *Barrels.*—Barrels are responsible for another interesting set of oaken fragments. The originals have been markedly small, in strong contrast with the huge tuns found at Silchester in 1896.[1] One example, complete save for the head and the hoops, was discovered in the ditch on the W. side of the N. gateway. There were fourteen staves, each with a length of between 13 and 14 inches and a maximum breadth of 2 inches (fig. 33, No. 14). When set up, they gave an inside depth of 12½ inches and a maximum diameter of 8 inches. The diameter of the bottom was only just over 5 inches. One of the staves, the uppermost in the illustration, has scratched upon it the name

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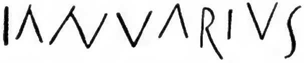
[1] *Archaeologia*, vol. lvi., Pl. viii.



Three barrel-heads came from Refuse-Hole No. 9, and another was picked up in a different part of the fort. The diameter of the largest is 5¾ inches, that of the smallest 3¼. The bung-holes range in diameter from 1¼ inches to ⅝ of an inch. A wooden bung was taken from the detached ditch in front of the E. gate.

(*d*) *Miscellaneous.*—A few stray pieces of wooden piping were found in the N. ditch. They are probably of willow, and they have had a diameter of about ¾ of an inch. As they were lying close to the Baths, it seems likely that they had some connection with the water-supply there; but they were so few in number and so small that it is idle to speculate regarding their exact purpose. A specimen is shown in fig. 33 (No. 8). Mention must also be made of a wooden bobbin (fig. 24, No. 6). It was lying 7 feet below the surface, immediately above the large wheel, in Refuse-Hole No. 6. When it first came to light, there were still some pieces of thread adhering to it. In shape it has a general resemblance to the corresponding modern article. It is 1⅝ inches in height, and has a diameter of ⅝ of an inch at the centre and 2 inches at either end. A little round box of willow wood from Refuse-Hole No. 9 is also interesting (fig. 33, No. 6). It is beautifully turned with the lathe, and has its upper edge grooved for the reception of a lid. It is 1¾ inches deep by 1½ inches in diameter. Then there are two combs, originally about 6 inches long, but now much shrunk through exposure to the air. One is from Refuse-Hole No. 1, the other from the N.W. corner of the outer ditch. In appearance they resemble the modern 'small-tooth' comb, and the neatness and care with which they have been cut are remarkable. In each case, one of the two rows of teeth is decidedly finer than the other. Lastly, several handles of tools were recovered in a more or less complete condition. One had the iron ferrule still adhering to it. In another instance—a bradawl—the metal blade was actually in position.

### *F. Leather.*

The collection of cast-off articles of ancient footgear is extraordinarily rich, amounting in all to some three or four hundred specimens, gathered partly from the refuse-holes and partly from the ditches. An exhaustive classification of these under their proper Latin names does not appear to be possible. Rome and its neighbourhood naturally dominate the literary tradition, and the same is true of much of the evidence that has been drawn from works of art. But the garrison of the Bar Hill fort was composed of Romanised provincials, not of Romans. It would not be reasonable to look for all the *modes* of the capital in the remnants of their dress. Besides, the climatic conditions of North Britain were severe. Combined with the scarcity of well-made roads or streets, they must have exercised an influence before which fashion itself would have to bow. In one respect, indeed, the reflection of Roman life is accurate and enlightening. The variety of pattern displayed by the remains, no less than the elaboration with which some of the individual examples are decorated, accords completely with the testimony of literature. Among the Romans, just as among the Greeks, money and ingenuity were freely lavished on the covering of the feet. The cut of a shoe might express a very real social distinction. Beyond this, and the possible influence of climate, the material now to be described has no general lesson to teach. In the meantime, it can best be judged by itself. Comparison even with the Saalburg finds shows a wide difference in custom.

Keeping this *caveat* in view, we may divide the footgear from Bar Hill into three main groups. The first corresponds to the *solea* or sandal proper. This is represented by a single example, which has been worn on the right foot of a lady or a youth (fig. 36, No. 9). It consists of five layers of leather carefully cut to shape—even the toes are indicated—and then fastened together, seemingly by some strong adhesive. It is studded with heavy nails. At one point between the layers space has been left for inserting a strap or thong that crossed the instep. A loop on the inner sole shows that the fastening was completed by a second thong that passed between the great toe and the toe next to it, and was then brought up the centre of the foot to join the ankle-thong. There has been no upper of any kind. So light a protection would be ill adapted for out-of-door use in Scotland, unless perhaps in the height of summer. Hence, we may suppose, its rarity.

The second group consists of broad, flat shoes such as are shown in fig. 36, Nos. 1 and 4. These are not very numerous,[1] but their occurrence in various sizes proves that they must have been worn not only by men, but also by women and by quite young children. Their leading characteristic is that each specimen is made of a single piece of leather. Except for a vertical line of stitching at the back of the heel, they are seamless. Perhaps they should be described as *carbatinae*.[2] The soles are always smooth and without nails. Hardly any two examples are alike in their upper parts. Usually the leather is cut into loops, through which we may suppose the laces to have run. The toe is often a series of narrow strips with an eyelet at the top of each. In one case there is a double layer of leather throughout. In another an inside sole has been used. In yet another the heel is strengthened by a 'counter.'

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[1] This is one of the respects in which there is a marked contrast with the Saalburg finds. See Jacobi, *Das Römerkastell Saalburg*, p. 497.

[2] See F. Haverfield, *Classical Review*, 1898, p. 142. A rather rude example from Chesters is figured in the *Cumberland and Westmorland Ant. and Arch. Society's Transactions*, N.S., v. p. 303. Similar shoes are still worn in some parts of Europe. See Haverfield, *l.c.*

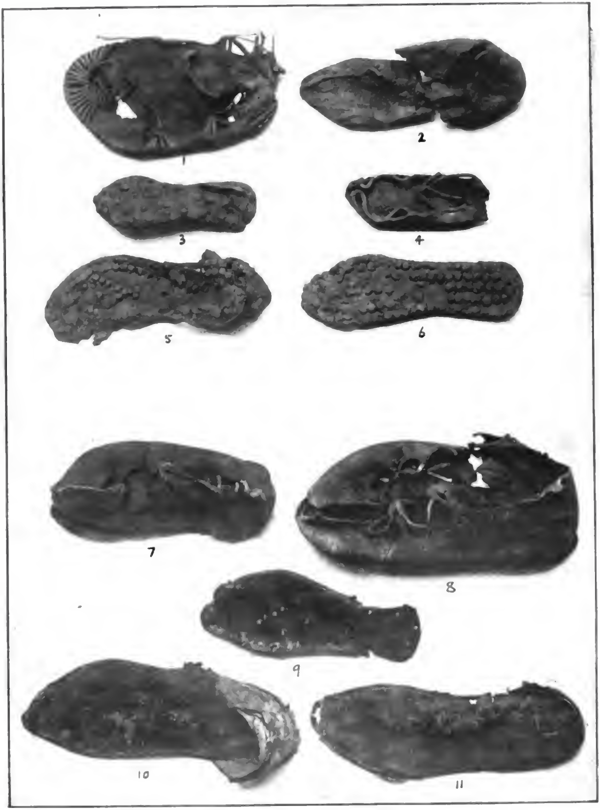

Fig. 36. Footgear of Various Types.

The third group approximates more nearly to the modern shoe. Sole and upper are quite distinct. Like the preceding, this type appears to have been worn by persons of both sexes and of all ages. It was clearly intended for out-of-door use. The soles are formed of several layers, generally four or five, and the precaution of studding them with heavy nails is never neglected even in the smallest sizes. The nails are sometimes arranged in decorative patterns, as on the lady's (or boy's) shoe represented in fig. 36, No. 5. The absence of any raised heel should be observed. Fig. 36, No. 3, is especially interesting. It must have belonged to a child of nine or ten. To correct some slight lameness, an iron support about 2 inches long and $\frac{1}{4}$ of an inch high has been driven in beneath the right side of the ankle. As will be seen from the specimens illustrated, there is great variety of pattern among the uppers. One extreme is represented by the solid leather of fig. 36, Nos. 7, 8, and 11, another by the delicate fretwork of fig. 37. Fig. 38

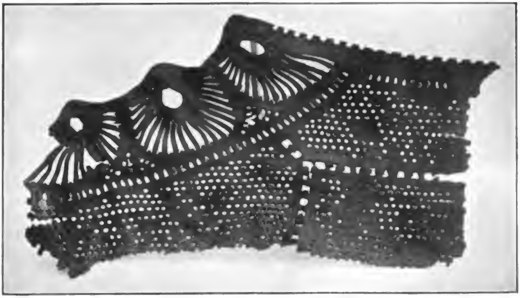

Fig. 37. Portion of Upper of Lady's Shoe.

shows examples (mounted on modern 'trees') of what we may consider as the medium, in all three sizes.[1]

The fastenings must have been very substantial. This is plain from the size of the openings left in the upper for their insertion. They resemble buttonholes rather than mere eyelets for laces. The explanation, no doubt, lies in the strain that would be produced by the heavy weight of the nail-studded soles. The method of attaching upper to sole was also well adapted to meet this difficulty. There was no stitching. Instead, the lower part of the upper—to the depth of about an inch all the way round—was thrust in between two of the layers forming the sole, and was presumably subjected to the process by which the various layers were made to adhere. Fig. 36, No. 8, is but one of many examples that show how the final touch of security was given by making some of the nails pass through upper and sole alike.

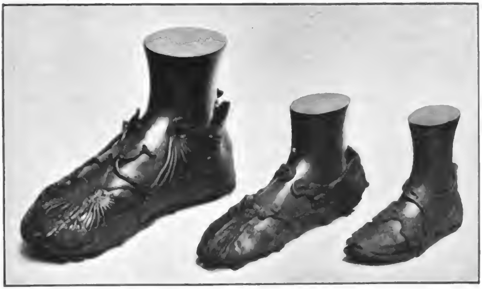

Fig. 38. Man's, Woman's, and Child's Shoe.

Possibly the shoes we have been describing would have been called

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[1] These specimens were set up for Mr Whitelaw at the Ashmolean Museum, Oxford.

*calcei.* It is probable that they were worn by the officers and the more well-to-do among the non-combatants. Yet they do not quite correspond to the *calceus* as ordinarily understood. Nor is the evidence sufficient to enable us to distinguish with any clearness between them and what must have been the footgear of the common soldier. Sheer force of numbers compels us to find the *caliga*, or private soldier's shoe, in the type represented by fig. 36, No. 10. Generically it belongs to our third group. The relation between sole and upper is the same as in the *calcei*. The construction of the sole, too, is the same, and there are the same heavy nails. But in practically every one of the scores of examples the upper has almost entirely disappeared. When any considerable vestiges are left, it is always at the heel that they are found. Their survival there is due to the extra protection afforded by the 'counter'—a stiff piece of leather inserted behind to provide the shoe with a strong back. At the best, however, the remnants are so scanty that we cannot say in any case what the original appearance of the whole may have been, and we are equally doubtful as to the nature of the fastenings and as to the manner in which they have been arranged.

In some of the better-preserved specimens of *calcei* leather laces were found still in their place. A few other objects of leather remain to be enumerated. An interesting relic is a bag or satchel—virtually entire, with its carrying strap—measuring 15 inches long by 12 inches deep At the two ends and on each side of the mouth, as well as along the carrying strap, it is very neatly stitched in herring-bone pattern with double-thong leather. A portion of a belt, 2 feet long by 1¼ inches broad, shows stitching along the centre and also at each side. A piece of double leather, 11½ inches long by 3 inches deep, scalloped to a depth of 2½ inches and stitched along its lower edge, may have belonged to the fringe of a tunic or to the trappings of a horse. Loose pieces of leather, of various sizes and qualities, are numerous. One of the largest of these, 2 feet 2 inches long by 1½ feet broad, may have been an apron. It was found in Refuse-Hole No. 9, with a 6-foot length of hemp rope rolled up inside of it.

### *G. Coins.*

Stuart, in his *Caledonia Romana*, speaks of Roman coins having been picked up on the site of the Bar Hill fort. He specifically mentions "*denarii* of Trajan, Hadrian, and Antoninus Pius, in the highest state of preservation," which "were procured by Professor Anderson, and are now deposited in Glasgow in the museum of the institution which bears his name."[1] These pieces are no longer traceable, and we must therefore be content with Stuart's vague description. Of the coins found in the course of Mr Whitelaw's excavations, four are probably Scottish. They are of copper and are absolutely illegible, but their size and appearance suggest that they belong to the seventeenth century. If we set these aside, and also certain corroded fragments (indubitably Roman) from the Baths,[2] there remain twenty-seven which must be connected with the presence of the Roman garrison. In the following list the specimens taken from the Well[3] are indicated by an asterisk:—

#### I. Denarii.

M. Antony (*circa* 35 B.C.)

| | No. of Specimens |
|---|---|
| 1. *Obv.* **ANT·AVG** (above), **III·VIR·R·P·C** (beneath). Praetorian galley with rowers.<br>*Rev.* Inscription illegible. Roman eagle, flanked by two standards. | 1* |

Vespasian (69–79 A.D.)

| | |
|---|---|
| 2. *Obv.* **[IMPC]AESVESPAVG[PM]** Head of Vespasian r., laureate.<br>*Rev.* **AVGVR** (above), **TRI·POT** (beneath). Instruments of sacrifice. | 1* |
| 3. *Obv.* **IMPCAESAR VESPASIANVSAVG** Head of Vespasian r., laureate.<br>*Rev.* **COS VIII** Mars, helmeted, standing l., holding trophy and spear. | 1 |

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[1] *Op. cit.* (second edition), p. 338.

[2] See *supra*, p. 46.

[3] See *supra*, p. 9.

### Domitian (81–96 A.D.)

No. of Specimens.

4. *Obv.* **IMPCAESDOMITAVG GERMPMTRPXV** Head of Domitian r., laureate. 1*
*Rev.* **IMPXXIICOSXVIICENSPPP** Minerva standing r. on prow, in attitude of attack.

### Nerva (96–98 A.D.)

5. *Obv.* **IMPNERVACAES AVGPMTRPOT** Head of Nerva r., laureate. 1
*Rev.* **COSIIIPATERPATRIAE** Instruments of sacrifice.

### Trajan (98–117 A.D.)

6-8. *Obv.* **IMPTRAIANOAVGGERDACPMTRP** Head of Trajan r., laureate. 3*
*Rev.* **COSVPPSPQROPTIMOPRINC** Hope standing l.
9-13. *Obv.* **IMPTRAIANOAVGGERDACPMTRPCOSVIPP** Head of Trajan r., laureate. 5*
*Rev.* **PAX** (beneath), **SPQROPTIMOPRINCIPI** Peace standing l., holding cornucopiae on l. arm, and with r. setting fire to a heap of booty.
14. Variety doubtful.

### Hadrian (117–138 A.D.)

15. *Obv.* **HADRIANVS AVGCOSIIIPP** Head of Hadrian r., laureate. 1*
*Rev.* **SALV SAVG** Health standing r., feeding serpent twined round altar.
16. *Obv.* Similar, but emperor bare-headed. 1
*Rev.* Similar.

### M. Aurelius (161–180 A.D.)

17. *Obv.* **AVRELIVSCAESAR AVGPIIFCOS** Youthful head of M. Aurelius r., bare. 1*
*Rev.* **PIETASAVG** Instruments of sacrifice.

### Uncertain.

18. Probably Trajan. 1
19, 20. Probably Hadrian. 2
21. Probably Antoninus Pius. 1
22. Undecipherable. 1

### II. 'First Brass.'

Trajan.

| | No. of Specimens. |
|---|---|
| 23. Variety doubtful. | 1 |

Hadrian.

| | |
|---|---|
| 24. *Obv.* **IMPCAESARTRAIANVS HADRIANVSAVG**<br>Bust of Hadrian r., laureate.<br>*Rev.* **PONTMAXTRPOTCOS - -** Fortune seated l.; in ex., **FORT RED**; in field, **S. C.** | 1 |

### III. 'Second Brass.'

| | |
|---|---|
| 25–27. Undecipherable. | 3 |

One or two of the coins in the preceding list might conceivably have been lost by the soldiers of Agricola; but the great majority of them certainly speak to us of the second invasion. Taken as a whole, they are just what we should look for under the circumstances. The evidence collected by Mr Haverfield[1] shows that (with the exception of the legionary denarii of Antony, for the survival of which there were special reasons) the Roman silver and bronze coins found in Scotland are, as a rule, not earlier than Nero and not later than Commodus. We know approximately upon other grounds the date when the Antonine fort was built (*circa* 140 A.D.). The coins found here and elsewhere on the line of the Vallum furnish a strong presumption that the whole work was abandoned before the close of the second century. We may thus venture to fix the period of continuous occupation at some forty years.

Apart from this general inference (which is not in itself new), the Bar Hill coins provide interesting material for the historian. Thirteen of the denarii were taken out of the well. Ten of these thirteen are made of pure tin, and have been run in moulds, not struck. The tin coins are quite unlike the work of ordinary forgers, since they can never have been intended to pass current as silver. Their light weight and the softness of the metal—they can readily be bent with the fingers—would have led to instant detection. Furthermore, the fact that in one case five, and in another case three, of the ten have been cast in the same moulds, shows that they cannot have found their way from a distance to North Britain in the ordinary process of trade. On the other hand, it is in the last degree unlikely that a forger would have selected as a convenient centre for the exercise of his activity a small military outpost on the very fringe of civilisation. The clue seems to lie in the character of the 'find-spot.' The throwing of money into wells or rivers from superstitious motives is a very familiar phenomenon. The tin denarii may have been shams expressly manufactured for devotional purposes. This would give a fresh significance to the prohibition in the *Digest* (xlviii. 10)—"*ne quis nummos stanneos, plumbeos emere, vendere dolo malo velit.*" What is there forbidden is not the manufacture of tin coins, but their being fraudulently passed into circulation.[1]

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[1] *The Antonine Wall Report*, pp. 159 ff.

### *H. Other Objects of Metal.*

Apart from the coins, the finds did not include a single object in either of the precious metals. Taken in conjunction with the almost entire absence of personal ornaments, this is significant. It would seem to indicate that the life of the fort had been very simple. When the troops were withdrawn, a strenuous effort would no doubt be made to remove everything of value. But a search carried out under such circumstances could not possibly have extended to the accidental losses that must have occurred during the years of occupation. Yet it was not so much the desire for display that was lacking as the means to gratify it; several of the articles in bronze have been treated in a manner that gives them a superficial resemblance to gold or silver.

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[1] The view of the tin coins put forward in this paragraph was set forth at greater length in a paper in the *Numismatic Chronicle* for 1905 (4th series, vol. v. pp. 10 ff.). To the references there given must be added a paper by F. Gnecchi on "Le Monete di Stagno" in *Riv. Ital. di Numismatica*, 1905, pp. 166 ff. Comm. Gnecchi accepts the suggestion that the Bar Hill coins are shams for devotional purposes. He mentions that he has had an analysis made of a certain number of pieces in his own possession, which were recovered from the Tiber, and that all of these proved to be of tin.

(*a*) *Iron.*—As might be expected, iron is the commonest metal. Many of the fragments are evidently part of the debris of buildings. Some of them are rusted beyond hope of recognition; but there are a good many the original character of which can still be satisfactorily determined. Nails and holdfasts, of various sizes and patterns, occurred frequently. A few are reproduced in the miscellaneous assortment of iron objects which will be found in fig. 39. Fifty-six pieces of 3-inch strap iron from the Well, placed end to end, give a total length of 47 feet. They are, on the average, $\frac{3}{16}$ of an inch thick, and are pierced at intervals for the passage of nails or bolts. Apparently they have at one time been very firmly attached to wooden beams. In a few cases the large nails or bolts are in their original position, held fast in place by rust. Two characteristic specimens of this strapping are illustrated in fig. 39, No. 6. Other pieces of flat iron, somewhat narrower and thinner, but likewise perforated for fastenings, may be the mountings of doors (fig. 39, Nos. 7 and 20). They, too, came from the Well, along with a latch $4\frac{1}{2}$ inches in length. The interesting group which is represented by fig. 39, Nos. 9 and 10, and which is also from the Well, should probably be connected with the framework of some of the windows in the buildings of the fort. The spikes have been riveted on to pieces of flat iron, as shown in No. 10, and their purpose would be to hold the panes of glass in position. Similar objects have been found at Pompeii, at Epinay in France, and also in one of the forts on the German *Limes*.[1]

The hoops belonging to the draw-bucket of the Well itself are illustrated in fig. 39, Nos. 1–5. There appear to have been seven of them in all. The topmost one (No. 2), recognisable by the 'eyes' for the rope, has a diameter of 14 inches. The corresponding dimension of the smallest is 12 inches, indicating that the taper on the bucket had been fairly gradual. No. 17 of the same figure is clearly the ferrule of a tool

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[1] The interpretation given above is that of Liger (*La Ferronerie*, Paris, 1875, vol. ii. pp. 241 f.). On the other hand, the object from Kastell Pfünz on the *Limes* is classed by Winkelmann as a door-mounting (*Der Obergermanische-Raetische Limes*, Lief. xiv., Taf. xviii. 7, and p. 26).

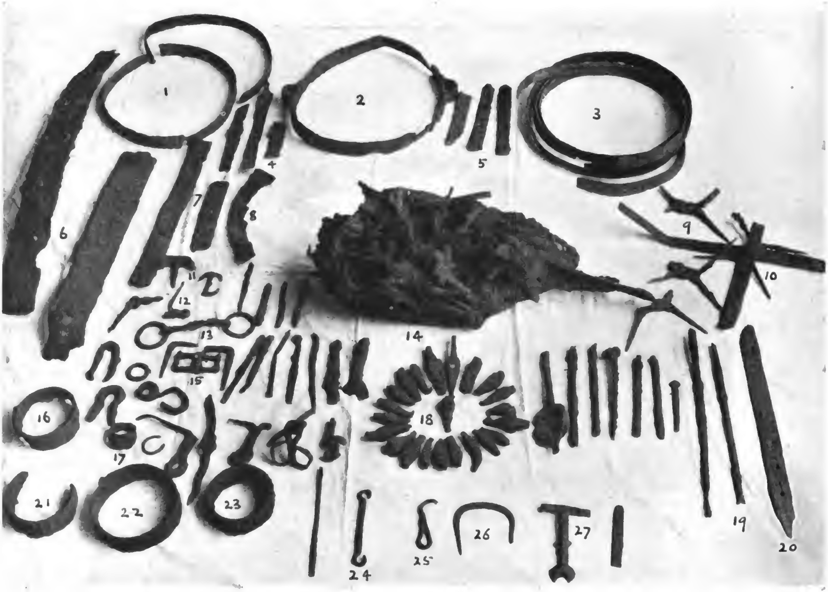


Fig. 39. Group of Iron Objects, mostly from the Well.

handle; the larger iron rings beside it (Nos. 16 and 21–23) may conceivably have belonged to the naves of wheels. It is not worth while speculating on the original association of detached hooks like No. 25. A buckle (No. 15), 3⅛ inches long by 1½ inches broad, is perhaps the remnant of a harness strap. A bridle-bit (No. 24), 5¼ inches long, with closing cleeks at either end, is curiously like its counterpart of to-day. The resemblance is even more striking in the case of another type of mouthpiece for a horse (No. 13).

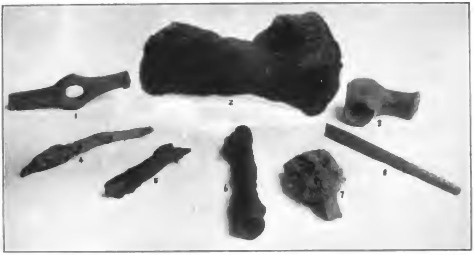
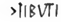


Fig. 40. Iron Tools and Weapons.

The tools and implements include a fragment of a sickle (fig. 39, No. 8), a much rusted axe-head (fig. 40, No. 2), a bradawl in its wooden handle, the leg of a pair of compasses, at least one mason's wedge, a pointed chisel, and two chisels with square faces. The chisels have had no handles, the top in each case bearing the marks of the mallet. The example shown in fig. 40 (No. 8) is 6½ inches long, and measures ½ an inch across the face. Immediately above it in the illustration is a hammer-head (No. 3), one end of which has been broken away. A second, but rather smaller, hammer-head is complete (No. 1); it has a length of 5¼ inches, and is excellently made. An interesting feature which it displays is the following inscription, scratched upon the upper side of its staved end, and indicating that the hammer had belonged to "the century of Ebutius."



Not all the tools admit of such ready identification. Among the more puzzling is a curious punch. The point, which has been square, is chipped away. The full length of what remains is 3 inches, and its squared and tapered shape rather resembles that of a heavy club, the girth at the thickest part being 2 inches. The metal is particularly hard, and has not rusted in any degree. Another strange implement is a piece of equally hard metal, 7 inches long, which looks like a screw bit. It is square for rather more than an inch at its upper end, and then round for the whole way beneath. On its lower portion, which tapers to a point, is a series of circular markings—a good deal worn, but apparently graded downwards, exactly as if its purpose had been to thread small screw nuts. Like the punch, it is free from rust. Rust, on the other hand, has played an important part in the preservation of one of the most remarkable of all the relics—the mass of wrought iron shown in the centre of fig. 39 (No. 14), and again separately in fig. 41. This was found inside a large fragment of the great amphora, discovered 38 feet down in the Well.[1] It is 25 inches long by about 10 inches at its broadest. That it retains its present form is due to cohesion induced by rusting. But its present form must be substantially that which it had when it was originally lost; the marks on the outside prove that it represents the contents of a bag which had at some time fallen or been thrown into the water. The folds of the bag, and the very grain of the material of which it was made, are still distinctly visible upon the surface. Here and there minute fragments of rust-covered thread can be detached. It is not possible to say much regarding the individual objects that the bag had contained. The majority seem to be large nails and holdfasts, but there is one which bears some resemblance to a pair of pliers.

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[1] See *supra*, p. 9 and p. 67.

Weapons are far from common. The tang of the handle of a bronze-mounted knife or dagger, with a portion of the wooden grip adhering (fig. 39, No. 12), was found 2 feet below the surface in the N.W. corner of the fort. A much rusted piece of iron from the Well may be a sword-blade, and there are several more or less fragmentary spear-heads. Two of the latter have been socketed on to the shaft (fig. 40, Nos. 5 and 6). In the case of another (fig. 40, No. 7) the stem is solid. A piece of round-backed iron, 1 foot 5 inches long, pierced at intervals for nails, may have been used for 'stiffening' the leather of a shield (fig. 39, No. 19).

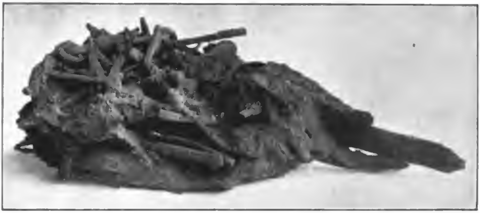

Fig. 41. Bag of wrought iron from the Well. (⅙.)

We have learned from the inscriptions that at one period there were Syrian bowmen in the garrison.[1] It is doubtless with the presence of this contingent that we should connect seven three-winged arrow-heads sifted out of the muddy deposit in the bottom of the Well. Two of these are reproduced in actual size in fig. 42 (Nos. 1 and 3). The workmanship is very good.[1] In the centre of the same illustration (No. 2)—and also in actual size—is one of the best preserved of five other objects found in close association with the arrow-heads. Like the latter, the five vary somewhat in their dimensions; like them, too, they are brought to a point at one end, and have three projecting wings. They are, however, open in the centre. Can they be the heads of arrows used for carrying fire? Such weapons were familiar to both Greeks and Romans. Pollux mentions *πυρφόροι ὀϊστοί* as a well-recognised class of arrows;[2] and Dio Cassius relates that, in the crisis of the battle of Actium, Octavius endeavoured to set Antony's ships ablaze by a shower

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[1] See *supra*, p. 85.

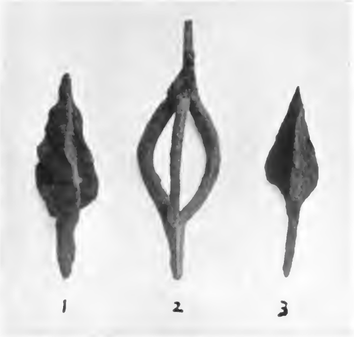

Fig. 42. Arrow-heads, etc., from the Well (1/1.)

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[1] It should be compared with that of the two isolated arrow-heads found at Housesteads (*Arch. Ael.*, xxv. p. 290, fig. 48). The eight hundred examples discovered in the Praetorium there were of much coarser make. *Cf.* also Jacobi, *Das Römerkastell Saalburg*, Taf. xxxix. 31.

[2] *Onomasticon*, i. 137.

of fiery shafts (*βέλη πυρφόρα*).[1] If this conjecture (for it is only a conjecture) be accepted, it is not difficult to imagine the method of use. A tuft of tow, steeped in pitch or other inflammable material, would be firmly twisted into the open iron framework at the point; this would be lighted before the arrow was discharged, and the fire would be fanned into a great flame by its rapid passage through the air.

The group distinguished as No. 18 in fig. 39 calls for some discussion. The twenty-two wedge-shaped articles that compose it were recovered from the Well. Each consists of a square head and a short square tang, the latter invariably broken. The head tapers to a point, and in every instance the point has been bent and blunted by use. There is considerable variation in the sizes. The heads are from 1¼ to 2¾ inches long, and from ½ an inch to 1 inch square at the thickest part; the tangs are usually about ⅜ of an inch square. When they were first found, the opinion formed regarding them was that they were a variety of masons' or smiths' tools. Subsequently, however, it was suggested that they were spikes that had been attached to the lower ends of spear-shafts. The latter view derived strong support from the position in which an object closely resembling them occurred in the tomb of a Gaulish warrior at Connantre, Marne.[2] But, not to speak of other obstacles in the way of its acceptance, it was difficult to account for such an accumulation of spikes without the heads of the spears to balance them.

As the excavations proceeded, evidence was forthcoming which seems to negative both of the explanations given above. From the outlying ditch that covered the E. gate of the fort there were taken four objects of the same class. One of these, which is shown in fig. 40 (No. 4), appears to furnish a clue to the real nature of the whole set. The tang is long, out of all proportion to what would have been possible in a tool or in the spike of a spear-shaft; it measures 4¼ inches, or rather more than twice as much as the head to which it belongs. Withal it is incomplete, the end showing clear signs of fracture. The *pilum*, or heavy javelin of the Roman soldier, is known to us, not only from the monuments, but also from actual specimens.[1] One of its leading characteristics was the great length of the iron head; inclusive of tang (if the word 'tang' be appropriate in the circumstances), it was about as long as the wooden shaft. If fig. 40, No. 4, be a fair index, we shall perhaps be justified in regarding the whole of the twenty-six objects in question as broken heads of *pila*. The variation in their size is entirely in favour of this hypothesis.[2]

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[1] *Hist. Rom.*, l. 34.

[2] See Morel, *La Champagne Souterraine* (Album), pl. 31, fig. 5. We owe this reference to Mr Reginald A. Smith, of the British Museum, with whom the suggestion itself originated. Mr Smith has also kindly given us help in connection with some of the other finds.

Among miscellaneous articles of iron we may mention a finger-ring with setting for a stone or seal, two fragments of a small chain of close curb pattern—respectively 2 inches and 1½ inches long—and a curious ingot, resembling an elongated barrel in shape, 2⅝ inches from end to end, with a circumference of 2¾ inches at the centre and of 1⅞ inches at the extremities. No. 27 of fig. 39 is a mounting of some sort; it is 5 inches long, and has apparently been fastened on leather. No. 26 of the same figure is particularly hard to find a use for. Had its inner edge been sharp, it might possibly have been interpreted as the blade of a bill-hook, such as sappers carry to this day; the end on the left is pointed as if meant to be driven into a wooden handle. But it is not improbable that the end on the right was at one time similarly pointed, while the edges are equally blunt all the way round, so that the suggested interpretation may at once be set aside.

(*b*) *Bronze*.—Objects of bronze (including kindred alloys) were not very numerous. The pot reproduced in fig. 26 (No. 2), which seems to be made of nearly pure copper, was found in the outer ditch at the S.E. corner of the fort. It is about 5 inches deep, with an outside diameter of 5½ inches at the top and 4 inches at the bottom, and a girth of 20 inches at its widest part. The simple device for attaching the handle has already been alluded to in another connection.[1] Fig. 43 shows, in actual size, an interesting little ornament that may once have been fastened to a helmet or some other article of wear; it was found in the outer ditch at the N.W. corner. The horned and bearded face which is embossed within the central circle may be meant for Jupiter Ammon, or it may be merely conventional. The maximum height of the relief is about ¼ of an inch. The colour of the whole is dull. One or two smaller pieces of bronze may be portions of harness mountings. The shapes to which they are cut show their decorative character, but their surfaces are perfectly plain. A bronze pin, nearly 5 inches long over all, is bent at its upper end into a circle which forms the head, the diameter of this part being 1⅛ inches. A small ring, having an inside diameter of an inch, and a cup-shaped disc, slightly smaller in size, are of uncertain purpose. The latter is pierced in the centre by a hole ¼ of an inch in diameter.[2]

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[1] See Lindenschmidt, *Tracht und Bewaffnung des römischen Heeres*, Taf. xi. Nos. 12–15; also *Der Obergermanische-Raetische Limes*, Lief. vii. p. 24; Jacobi, *Das Römerkastell Saalburg*, p. 489, Taf. xxxix. Nos. 5, 6, 7, and 13.

[2] See *Bonner Jahrbücher*, 1895, pp. 240 f.

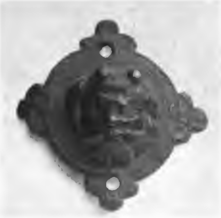

Fig. 43. Ornament of Bronze. ($\frac{1}{1}$.)

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[1] See *supra*, p. 74.

[2] It rather resembles the 'button' of horn figured by Jacobi, *Das Römerkastell Saalburg*, Taf. lxxii. No. 5.

Three pieces of metallic foil with a bronze-coloured lacquer have apparently been wound round some article that has been square in shape. The original outline is still retained. They vary in size from 4 inches by 2 to 3¼ inches by 1⅛, and the foil has a thickness of about $\frac{1}{64}$ of an inch. Two small rectangular plates of bronze—one an inch square, the other an inch high and 1¼ inches long—have evidently served as corner-pieces for the mounting of a square-sided box or casket. They have been treated in such a way as to give them a bright golden tint, which still retains its brilliance almost undimmed. The same treatment has been applied to three flat discs, just over an inch in diameter. Into the centre of two of these discs there have been riveted pins which project rather less than an inch from their surface. In one case the pin is round; in the other it is flat, and pierced by a hole at the upper end. Whatever the use of the third disc may have been, it is clear that the two with pins are of the nature of studs or fastenings for dress.[1] Eleven fragments of a bronze drinking-cup or quaich were taken out of the Well; they represent about one-half of the original vessel, which has been rather more than an inch deep, with a probable diameter of 1¾ inches at the bottom and 3½ inches at the top. The bottom is flat, and the outward slope of the sides straight and regular. In this instance, the bronze has the appearance of tarnished silver. The same alloy occurs in a flat crescent-shaped fragment, which has belonged to a different vessel, and also in a flattish ring, with an outside diameter of $2\frac{3}{16}$ inches. A small lump of similar metal, about 2 inches in diameter, looks as if it had come from the bottom of a crucible, the shape of which it still retains.

(*c*) *Lead.*—Articles of lead were comparatively uncommon. One of the most interesting is a mason's plumb-ball, 1⅛ inches in diameter, with an iron staple for the suspending cord; the under side of the crown of the staple shows very considerable marks of wear. A bullet-like object, ⅝ of an inch in diameter and perfectly round, was discovered 2 feet below the present surface, in the gutter on the W. side of the street that separated the Praetorium from the Storehouse. A lead pin, found near the Well, has a round shank nearly 2 inches long; its head is in the form of an oval ring, the major axis of which measures about an inch, the minor axis rather less than half as much. A disc, 1¼ inches in diameter and ⅛ of an inch thick, looks as if it had been cut for a counter. One of its surfaces is slightly hollowed. Three small, unfinished lumps came out of the Well. One of them is pierced by a single hole; another, 2½ inches in diameter by ½ an inch in thickness, would appear to be from the bottom of a crucible.

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[1] On the method of use, see Jacobi, *Das Römerkastell Saalburg*, p. 503, Taf. lii. Nos. 1-3.

### *I. Bone and Horn.*

Two manufactured articles of bone demand notice. The first is a small disc, $\frac{13}{16}$ of an inch in diameter, which is polished smooth on both sides, but has its upper surface decorated with a series of concentric circles. The second is a cylindrically shaped object, 3½ inches long, which was found in Refuse-Hole No. 1. Although it is complete so far as length is concerned, a considerable portion of the whole is broken away. Enough, however, remains to enable us to reconstruct the original. The inside has been hollow. The extreme diameter has been about ¾ of an inch at the ends, gradually increasing towards the centre. The smooth outside surface is ornamented with markings—short lines, circles, and crosses—arranged in a simple pattern. Rather nearer one end of the cylinder than the other, two oblong holes have been cut lengthwise on opposite sides; they obviously correspond, as if intended to admit of something being inserted at right angles. A similar object is figured by Mr Roach Smith in his *Roman London.*[1] A small group of them was discovered many years ago in a cave at Borness in Kirkcudbrightshire.[2] Their purpose is quite uncertain. Mr Roach Smith suggests that the one he describes may be the "handle of some cutting instrument," and the authors of the account of the Borness find are inclined to share this view. Mr R. A. Smith, of the British Museum,

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[1] Pl. xxxiv. 5.

[2] *Proceedings*, vol. x. (1875), pl. xxi.

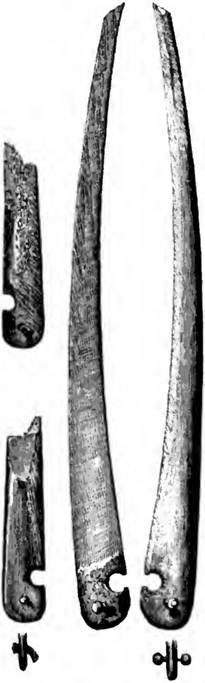

Fig. 44. Objects of Horn. (½.)

writes to us that he thinks the articles may, perhaps, be cross-pieces for the ends of bridle-bits. In the present state of knowledge neither of these solutions seems entirely convincing.

Many of the numerous pieces of deer horn from the refuse-holes and the Well have evidently been sawn, probably because the part removed was to be turned to good account. Horn would be useful in various ways. It has certainly provided what is, so far, the most baffling problem that the excavations have yielded—six pieces found in different quarters of the fort.[1] Four of these are little better than fragments; the other two are shown in fig. 44. Thirty-two similar objects of horn were discovered in the armoury of the great legionary fortress of Carnuntum. These last have been discussed at some length by von Groller, whose description of them may be summarised as follows:[2] "Each of the fragments has once been a more or less considerable part of a larger piece which has had the form of a gently curving sabre-blade.

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[1] One was found in the Well, one in Refuse-Hole No. 1, and the remaining four in the ditches.

[2] *Der Röm. Limes in Oesterreich*, Heft ii. p. 131, Taf. xxiv., figs. 22–24.

One side of this whole has been smooth, the other slightly convex. The corners of the broad end are sometimes rounded, sometimes angular. The narrow end terminates in a blunt, rounded point. The whole of the flat side and portions of the convex side have been roughened with a file. Near the broad end a rounded notch has been cut, stretching from the edge almost to the centre. In the great majority of cases the surface in the immediate neighbourhood of the notch has been polished very smooth, apparently by use. The position of the notch in the various pieces points to a distinction between 'rights' and 'lefts,' showing that a pair went to the making of each of the original articles. The two pieces of horn must have enclosed something between them; otherwise, there would have been no reason to cut them separately. These three parts, however, have not been fastened together by nails or rivets; the pieces of horn show no marks of perforation. They must, therefore, have been attached by some adhesive. What lay in the centre can hardly have been made of metal; leather or cloth would adhere to metal, but horn or bone would not. It is most probable that what was enclosed between the pieces of horn was made of wood." Beyond these general statements von Groller does not venture to go. He frankly admits that he has no satisfactory explanation to offer, and concludes by a reference to a similar piece of horn now in his own possession.[1] Before he acquired it, this last had for many years been in private hands at Hainburg. Of the place or circumstances of its discovery, nothing is known; but its presence at Hainburg rather points to its also having come from Carnuntum, which is close by. It differs from any of the certain Carnuntum specimens in having an iron nail driven through the centre of the broad end. From the length of the nail von Groller infers that the space between the two pieces of horn—and, consequently, the thickness of whatever lay between—cannot have exceeded three millimetres.

Turning now to the examples from Bar Hill, we find that five out of the six add practically nothing to the facts as noted by von Groller. One represents a narrow end, which is brought to a fairly sharp point. Three are fragments of the body. The fifth, two views of which are given on the left in fig. 44, is a broad end. It will be observed that it is pierced with an iron nail, like the Hainburg specimen. The iron nail must be about the same size in both cases, as can be seen from the reproduction at the bottom of the left-hand side in fig. 44. An examination of the five reveals all the characteristic features enumerated in the description quoted above. Only in one respect does it suggest a correction. It appears by no means clear that the flat side has been roughened by the application of a file; the markings there—apart from those produced by the saw with which the horn was originally cut—may be purely accidental.

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[1] *Loc. cit.*, fig. 25.

The sixth of the Bar Hill examples stands by itself. It is slightly larger than any of the others,[1] and is at the same time decidedly superior in finish. It is also more complete. While illustrating nearly all the points mentioned by von Groller—the peculiar shape, the characteristic notch,[2] the artificial roughening of portions of the convex side—it supplements his description in one or two ways that are rather important. As will be observed from fig. 44, where the two sides are shown on the right, the horn portion of this particular specimen has not been formed of two halves, as is usual. It has been made of a single piece. For a distance of about an inch and a quarter the broad end is convex on both sides. On one side the convexity ends abruptly along a line that exhibits all the signs of fracture. Inside this line is a narrow ridge, clean-cut and regular, hardly more than $\frac{1}{32}$ of an inch in breadth. At one extremity, a tiny fragment of the convex portion projects beyond the normal line of fracture in such a way as to make it evident that the clean-cut ridge may be taken as a measure of the space that had separated the two blades of horn. The interval is thus much smaller than von Groller's maximum, and one cannot but admire the firmness of the hand and the fineness of the saw that succeeded in removing so thin a slice with so much neatness. We can readily understand why it was much more common to employ two separate pieces. At the same time, we are forced to doubt whether wood—or, for that matter of it, anything else—was ever permanently fastened between. Another feature of peculiar interest attaches to the specimen under discussion. In spite of the fact that the broad end is solid, it is pierced by a hole through which passes a brass rivet with a round head at either end. In the circumstances this can only have been intended for suspension; and the size of the rivet, a side view of which will be found in fig. 44, was adjusted to the size of the hole in such a way that, when suspended, the mysterious implement must have swung freely.

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[1] Without reckoning the curve, it is 10½ inches long, and has originally been slightly longer. The notch is about $\frac{5}{16}$ of an inch deep.

[2] The notch, however, is not nearly so much worn round its edge as is the case in the other Bar Hill example.

The surroundings of the Carnuntum find appear to indicate that it is in military equipment that the clue to the nature and purpose of the article will have to be sought. We have no definite hypothesis to advance, for we have hit upon none that is free from serious objection. But attention may be directed to a remarkable analogy. Objects of bone which bear a striking resemblance to the pieces of horn, and which seem to be their lineal descendants, occur in association with early mediaeval burials in Hungary. The only available descriptions are hardly sufficiently detailed to make close comparison possible.[1] Apart, however, from a general correspondence in size and shape, there is one feature common to both classes that points conclusively to a connection between them,—the rounded notch in the side at the broad end. The wear to which this has been subjected in the case of the horn articles proves that it must have played an important part in whatever use they were put to. Its recurrence in the same position in the bone objects from Hungary goes far to demonstrate that the two sets of things are substantially identical in character. A few particulars regarding the discovery of some of the Hungarian examples may, therefore, be noted. At Szabadka a pair were found in a grave which Hampel assigns to the seventh or eighth century. This grave also yielded, among other relics, the remains of one or two weaving instruments.[1] At Győr, two graves (not dated by Hampel) each contained a single pair. In one instance the pieces of bone were lying side by side close to the *tibia* of the skeleton, the narrow end stretching down to the ankle.[2]

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[1] Joseph Hampel, *Alterthümer des frühen Mittelalters in Ungarn* (1905). Exact references are given below. We have to thank Dr Anderson for bringing the importance of this book to our notice.

### *J. Animal Remains.*

A very large quantity of bones of animals were collected from the refuse-holes. For the most part these must represent the flesh food of the garrison. Dr T. H. Bryce, of Glasgow University, was good enough to examine them carefully, and has furnished us with the following interesting report:—

> Comparatively few species are represented. The great mass of the bones belong to oxen and sheep, and the chief interest centres in the identification of the breeds of these domestic animals.
>
> The *ox* is represented by a considerable number of skulls, several of which are nearly complete, as well as by many metacarpals, metatarsals, scapulae, and vertebrae. The skulls vary much in size. Some are horned, and some without horn cores. The largest specimen measures 20 inches from the ridge between the horn cores to the top of the premaxilla, and 16½ inches between the tips of the horn cores. The horn cores vary very much in length, but many of them are so short that the breed was certainly a short-horned breed. A great many of the scapulae, metacarpals, and metatarsals further indicate a small breed of cattle, and, judging from the characters of the frontal bone and the direction of the horns, we can certainly refer some specimens to the dwarf Celtic shorthorn (*Bos longifrons*). Not a few, however, seem to be too massive for this variety, and several of the skulls have horns too long and upturned for the breed in its purity. These large-horned specimens do not represent *Bos primigenius*, and it must be concluded that the Romans here had a larger, probably a mixed, breed of oxen, besides the small Celtic shorthorn.

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[1] See *op. cit.*, vol. ii. pp. 839 f.; and vol. iii. (Atlas), Taf. 494, Nos. 2 f. For the date, see vol. i. p. 849.

[2] *Op. cit.*, vol. ii pp. 812 f.; and vol. iii., Taf. 481, Nos. 1 f.

The *sheep* is represented by some complete skulls, and also by metacarpals, metatarsals, and other bones. The skulls are specially small and narrow, and these are to be associated with a series of very long and slender metacarpals and metatarsals. I have compared in detail these bones with those of the small slender-legged Soa sheep of St Kilda, and I find that they correspond exactly. This slender-legged breed has been found on many sites of the Romano-British period, and the comparison with the Soa sheep has been worked out by General Pitt Rivers in the account of his excavations in the Romano-British village of Rotherley, Wilts.[1] A few of the metacarpals do not differ in their dimensions from those of the modern sheep. It is therefore probable that the slender-legged breed was not the only one possessed by the Romans in this fort.

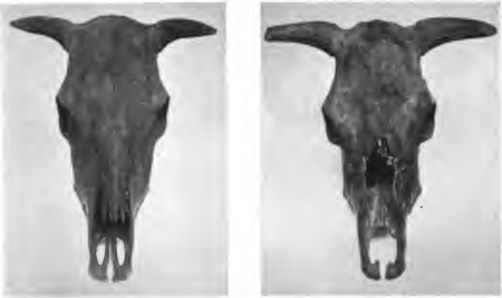

Fig. 45. Skulls of *Bos longifrons* (⅛).

The *deer* is represented by many horns. They are all those of the red deer; the roe and the fallow are not present.

The *horse* does not seem to have been used as food. There was only one bone—a mandible—among the remains. It is a short and specially narrow jaw, indicating a small breed of animal.

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[1] Pitt Rivers, *Excavations in Cranborne Chase*, vol. ii. pp. 226 ff.

> The *dog* is indicated by two skulls as well as by other bones. These belong to two breeds—the one a large, the second a small variety. The skull of the large dog is almost certainly that of a domestic animal, and not that of a wolf.
>
> The following is a list of the animals I have identified among the remains:—
>
> 1. Ox (*Bos longifrons* and a mixed breed).
> 2. Sheep (*Ovis aries var.*)—slender-legged variety.
> 3. Pig (*Sus scrofa*). The remains are those of the domestic boar, but the wild boar is represented by two tusks.
> 4. Dog (*Canis familiaris*)—two breeds.
> 5. Horse (*Equus caballus*)—pony breed.
> 6. Fox (*Canis vulpes*).
> 7. Red deer (*Cervus elephas*).
>
> It should be added that among the animal bones there occurred a number of human metacarpal and metatarsal bones and phalanges—the relics of the work either of the surgeon or of the executioner.

Besides animal food, in the narrower sense of the term, the soldiers of the garrison also ate shell-fish. The fondness of the Romans for this delicacy is matter of common knowledge. They seem to have eaten almost every variety that was not positively unwholesome.[1] The shells found at Bar Hill belonged to one or other of two kinds—the common oyster (*Ostrea edulis*, Linn.), and the horse mussel (*Modiola modiolus*, Linn.).[2] There is nothing surprising in the occurrence of the former. As early as Juvenal's time, long before the Vallum of Pius was built, British oysters were imported into Italy.[3] But the popularity of the horse mussel is rather contrary to the canons of modern taste; nowadays it is eaten but rarely, and then only under pressure of dire poverty.[4] A somewhat curious fact remains to be recorded. A few of the oyster-shells were found in the Well; the rest, and also the whole of the mussel-shells, came from the refuse-holes in the *retentura* or southern half of the fort, the most prolific being Refuse-Hole No. 6. Neither of the two great pits in the *prætentura*, rich as they were in bones, yielded a single shell. Has this any ethnographical significance? The inscriptions tell us of the presence in the fort of two regiments of different nationalities—one from Syria, the other from the Low Countries.[1] Can we venture to suppose that the Hamii shared the passion of the Romans for shell-fish, while the Baetasii cared for none of these things? Or are we to invert the supposition? Or ought we rather to look upon the distribution of the shells as nothing but an accident, due perhaps to a difference in date, or to some variation in the commissariat arrangements?

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[1] *Cf.* Celsus, ii. 29, "*cochleae . . . ostrea, pelorides, echini, musculi, et omnes fere conchulae.*"

[2] Dr R. H. Traquair, F.R.S., of the Royal Scottish Museum, has kindly verified these identifications.

[3] Juvenal, *Sat.* iv. 140.

[4] George Jeffreys, *British Conchology*, ii. p. 112.

### *K. Miscellaneous.*

Under this head there fall to be included a very few articles to which there has as yet been no opportunity of referring. A good many hazel-nuts were found in the Well, and in some of the refuse-holes. The Well was also responsible for one or two walnuts—apparently grown in an uncongenial climate, as they were stunted and had no kernels. The various pieces of hemp rope picked up here and there would make a length of 10 or 12 feet in all; the average diameter was ⅝ of an inch. Bark rope was also in use; several fragments were recovered from the detached ditch on the E. side of the fort. Three bunches of plaited horsehair have possibly been harness trappings; they were found in the ditches. Nothing else appears to call for particular mention.

## VI. SUMMARY OF RESULTS.

Before the record is closed, it may be convenient to sum up shortly the main results of Mr Whitelaw's excavations. Archaeology has for the first time been brought into immediate, certain contact with the handiwork of Agricola. That general's reputation as a skilful officer of engineers has been strikingly confirmed. On the other hand, his 'conquest' of Caledonia would seem to have reduced itself to the level of a brilliant raid, followed by a brief and precarious tenure of a few advanced positions. His tiny garrisons in the heart of the enemy's country, far beyond their base of operations, would be constantly exposed to serious menace. For their regular supplies they must have been dependent on the support of the fleet. Tacitus attributes the abandonment of this bold adventure to the jealousy of Domitian. In the light of the prolonged struggle that we know to have ensued, such a sinister explanation is surely unnecessary. At any rate, the emperor, in insisting on withdrawal, showed a far sounder appreciation of the gravity of the frontier problem than had been displayed by his lieutenant. Two generations were to pass before the Roman outposts were again pushed forward to the isthmus; the turbulent warriors whom Lollius Urbicus sought to keep in check were the children's children of the men that had fought against Agricola. In the interval much blood had been spilt, and Hadrian's efforts at pacification had given the Romans a fresh base on the line from Tyne to Solway. Yet the force now planted on the Bar Hill was far larger than the mere handful that had essayed to hold it sixty years before. The significance of that fact is not to be disputed.

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[1] See *supra*, p. 85.

But the second or Antonine fort is different. We shall misinterpret it if we treat it as an isolated phenomenon. It marks the definite inclusion of Southern Scotland within the sphere of organised frontier defence, and the exposing of its outlines has revealed what might have been anticipated. The fort is typical of many more that lay scattered at strategic points along the marches of the Roman Empire. These *castella*, as they were called,—everywhere garrisoned by auxiliaries like the Baetasii and the Hamii,—were the pawns in the grim game of frontier war. Behind them the real fighting strength of the army was concentrated in legionary fortresses, like Deva and Eburacum in Britain, like Novaesium on the Gaulish side of the Rhine, or like Carnuntum on the southern bank of the Danube. Viewed in this light, the *castellum* on the Bar Hill does not differ in general plan from others of its class. The central space in the Praetorium, it is true, presents a peculiarity that is hard to understand. And there is another feature calling for remark. Usually the bath-house was built a little distance off, outside the main enclosure; here it was within the fortifications. The 'caespiticious' rampart, too, is interesting. It links Bar Hill with Rough Castle and with the great Vallum, to which both alike belonged. The defences, however, have been somewhat simpler than the corresponding works in either of the two other Vallum 'stations' recently explored,—less solid than the stone walls of Castlecary, less impressive than the formidable lines that still rise round Rough Castle. Comparison between the three interiors is scarcely possible. At Bar Hill the main outlines were fairly intelligible. In neither of the other cases did any clear idea of the whole emerge. The Praetorium in each was easily recognised, and the Storehouse was unmistakable. A few additional buildings were located, but their details were disappointingly obscure; we do not know, for instance (as we do at Bar Hill), in what direction the barracks of the soldiery were placed, nor of what material they were built.

In the matter of relics, the Bar Hill excavations were fruitful to a quite exceptional degree. It is practically certain that all of these belong to the period of the Antonine occupation. The life they mirror for us betrays small sign of luxury. It is a life of hard work and hearty feeding, with but little extravagance or refinement about it. What we see is not the Roman himself, but the provincial who has assimilated the practical side of Roman civilisation. It is noteworthy that, in glancing through the finds, one is reminded far more frequently of the artisan than of the soldier. One realises that the whole site was not merely a fort, in the modern sense of the word. It was also a permanent military settlement. Nothing brings this home so vividly, or with so distinctively human a touch, as the heaps of shoes that have been worn by women and by children. These followers cannot, of course, have dwelt within the gates; that would have been a grave breach of military law. They must have been housed outside, with traders and others, in an *annexe* or civil settlement such as was invariably associated both with the *castella* of the auxiliary cohorts and with the *hiberna* of the legions. At Bar Hill the *annexe* seems to have lain towards the East. That is the position suggested by such knowledge as we possess of other civil settlements along the line of the Vallum. What is perhaps more to the point, the situation of the Castle Hill Park is admirably suited for the purpose. Further, attention has already been drawn to possible marks of its having been occupied in Roman times.[1] It may now be added that trial cuttings on the ridge leading from the fort to the highest peak have produced more definite traces—the remains of fireplaces, and abundant fragments of pottery. If the whole of this quarter could be as thoroughly explored as the area of the fort itself has been, it is probable that considerable additions would be made to our stock of information. The *annexe* must have had its refuse-holes as surely as the fort, and it is not impossible that it contained a larger number of inscriptions.

The relics have helped us to a clearer appreciation of the character of the occupation. How far do they throw light upon its history? The inscribed slab shows that the fort was built in the reign of Antoninus Pius. The coins, unfortunately, are less instructive than is usual. They do not really carry us any farther than the slab, for the solitary denarius of Marcus Aurelius—or, rather, the original on which it is modelled—is not later than 143 A.D. But the scores of cast-off shoes, the odds and ends of refuse, and the innumerable potsherds are all eloquent of years of continuous habitation. They justify us in concluding that Bar Hill was held till Southern Scotland was abandoned—that is, till some crisis that probably fell within the reign of Commodus.[2] Finally, we get a lurid glimpse of the last scene of all. It is plain that there was a great conflagration on the retirement of the defenders. The hands that fired the woodwork were without doubt the same hands as wrecked the Praetorium and cast the debris down the Well. Were they Roman or Caledonian? Was the destruction wrought in sheer vindictiveness? Or was there a deliberate intention to try and render the fort untenable by a victorious foe? Was the altar thrust out of sight to save it from possible desecration? Or was it thrown down in contemptuous defiance of the gods of the retreating soldiery? These are questions that inevitably suggest themselves. In the meantime, imagination alone can return an answer. One thing, however, it is safe to say. The occurrence of similar phenomena elsewhere—at Birrens, for instance, and probably at Newstead—affords some ground for believing that the proceedings at Bar Hill were part of a general policy. If this be really so, then careful excavation upon other sites, combined with the accurate observation of minute details, may ultimately put into our hands a clue that will transform conjecture into certainty.

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[1] See *supra*, p. 3.

[2] *The Antonine Wall Report*, pp. 158 f.

## APPENDIX.

The following is a complete list of the objects that were taken out of the Well:—

> A large amphora (p. 66), 3 fragments of 'Samian' ware; 21 freestone columns, or portions of columns, of a total length of 64 feet, along with 14 bases and 11 capitals (p. 134), a large altar with inscription (p. 80), 3 considerable fragments of an inscribed slab (p. 82), several ballista stones, varying in diameter from 4½ to 1¼ inches, a piece of flint pebble, a black tessera for mosaic pavement (p. 78), a piece of black slaty stone, smoothed, a piece of shale, 2 round discs or counters of black composition, small object resembling a coin-mould (p. 91), 2 pieces jasper stone; about 30 pieces of oak, varying in length from 9 feet to 1 foot, in breadth from 6 inches to 3 inches, and in thickness from 5 inches to 2 inches (p. 92), portion of overhead beam of Well, with 2 pieces of pulley wheel (p. 92); 12 small pieces of leather, 2 boots; 56 pieces of 3-inch by ¼ strap iron, of a total length of 47 feet (p. 111), a door-latch of iron (p. 111), 10 pieces of 1 to 1¼ inch flat iron, with spikes riveted on (p. 111), 7 pieces of 1½-inch flat iron, perforated with holes (p. 111), several other pieces of varying breadths, 4 iron holdfast, swivel-jointed, hanging cleeks, 6 pieces of iron of various shapes, 3 pieces of welded iron cleeks, more than 50 miscellaneous pieces of scrap iron, including nails, bolts, etc., 1 piece flat iron, welded, 1 foot 4 inches long by 1½ inches broad by ½ an inch thick, 1 bag full of nails and wrought-iron tools, etc. (p. 114), 3 pieces of iron bridle-bits with rings (p. 113), 1 bridle-bit with closing cleeks on either side (p. 113), 3 pieces of 1½-inch strap iron ring, one 5 and two 3½ inches in diameter

(p. 113), 4 complete iron hoops of bucket and 8 fragments (p. 111), 1 iron harness buckle (p. 113), 1 iron ferrule, 1½ inches by 1¼, a piece of a sickle-blade, 11½ inches long by 1¾ broad (p. 113), 2 chisels, 1 wooden handle with tapered iron ferrule, 1 leg of a pair of compasses (p. 113), 1 ring of round iron having an inside diameter of 1 inch and an outside diameter of 1½, another iron ring with an inside diameter of 1⅛ and an outside diameter of 1⅜ inches, 1 piece of round-backed iron, 1 foot 5 inches long by 1¼ inches broad (p. 115), 22 wedge-shaped articles of iron from 1¼ to 2¾ inches in length (p. 117), 7 three-winged arrow-heads (p. 115), 5 objects somewhat similar but open (p. 116), 1 iron finger-ring (p. 118), 1 punch of hard metal (p. 114), 11 pieces of a bronze drinking-cup (p. 120), 1 piece of another vessel of bronze, piece of bronze from crucible, 3 pieces of metallic foil with bronze lacquer (p. 120), 1 small bronze harness ornament, portion of bronze ring with diameter of about 1 inch; 3 pieces of lead (p. 121); 13 coins (p. 107); 3 small pieces of horn; 1 red deer's horn; 2 red deer's hoofs; 1 ox's horn; 2 large shoulder-blades and various other bones of ox; 1 shoulder-blade, 2 jaw-bones, and 1 horn of sheep; forepart of skull of very small carnivorous animal, perhaps a weasel; 17 ox's teeth, and a number of tusks and teeth of other animals; several oyster-shells; quantity of hazelnuts; one or two walnuts; twig of hawthorn; skin of *scleroderma*.

## NOTE ON THE ARCHITECTURAL FRAGMENTS.

By THOMAS ROSS, F.S.A.Scot.

The collection of architectural details from Bar Hill is certainly the finest hitherto found in Scotland. The forts previously excavated have provided abundant evidence of extensive buildings, skilfully planned and involving the use of pillars, pilasters, buttresses, arches, apsidal alcoves of rooms, and such like; but, although we could infer from these the existence of various architectural features, we were unable to say what they were like, owing to the fact that most of the stones had been removed. We are now in a much better position to form a clear idea of the real character of the architecture of Roman *castella* in Scotland.

The remains, with the exception of a capital from Refuse-Hole No. 7, were found in the Well, probably not far from the place they originally adorned. They included shafts of pillars, capitals, and bases, all wonderfully well preserved. The shafts (see fig. 14) are circular and in various lengths, the tallest fragment measuring 5 feet 4 inches, and tapering in this height from 13 to 12 inches in diameter. Three other fragments are a few inches shorter, and other pieces decrease in length to 4 feet 9 inches, 3 feet 6 inches, and 1 foot 9 inches. The diameter of the shafts at the neck varies from 10 to 12 inches. If the pieces, which numbered twenty-one in all, were placed end to end, their united length would be about 64 lineal feet.

The twelve capitals have each a circular beaded neck-moulding, about 2 inches deep, from which they spread out in a concave bell shape to a square Doric abacus. They are of different sizes, the height from the under side of the neck-moulding to the top bed varying from 10½ to 13½ inches, and the depth of the abacus from 3 to 6 inches. In no instance is the abacus exactly square. A few examples of the variations may be of interest:—

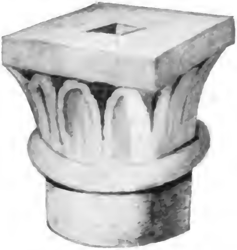

Fig. 46. Carved Capital.

16 inches × 14¾ inches
16¼ ,, × 12¾ .,
15¼ ,, × 14⅛ ,,
12¾ ,, × 12⅝ ,,

One of the capitals (fig. 46) is carved with upright leaves in the bell. The carving is confined to two sides, and the leaves are roughly cut—

blocked out rather than finished. This particular example is 12 inches high, the abacus being 3¼ and the necking 2 inches deep. The square of the abacus is 15 by 13½ inches, and the diameter of the shaft is 11 inches. Another capital (fig. 47) is entirely square on plan. The neck-moulding, however, and part of the shaft are half-rounded. The abacus, which is 5 inches deep, is divided by an incised line, and the lower part is decorated with a neat, well-cut, and well-preserved chevron ornament. The group contains another fragment of a similar capital (fig. 48); but instead of being square, this latter has its angles rounded or chamfered. The chevron is the same in both. It is possible that these two capitals had shafts of a corresponding section, and that they were wall-responds. The fact that they are left unfinished on one side is in favour of this view. It may be added that, in 1847, there was discovered at Castlehill Fort, near the western end of the Vallum, the base of a rounded pillar (fig. 49) having the chevron carved on the square plinth, exactly as in the present example. It was lying beside an inscribed stone bearing the name of the Twentieth Legion. The two capitals shown in

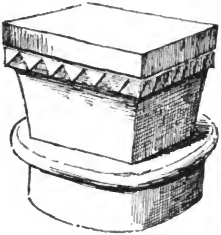
Fig. 47. Square Capital.

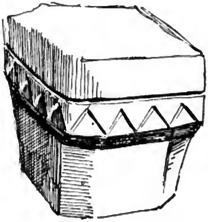
Fig. 48. Chamfered Capital.

fig. 50 will serve to illustrate the general design of all. It will be observed that one of them has been rudely hacked into, not improbably in order to obtain a fastening or rest for a piece of timber required by some alteration.

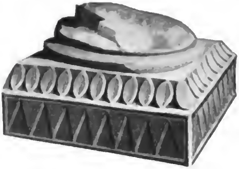

Fig. 49. Base from Castlehill Fort.

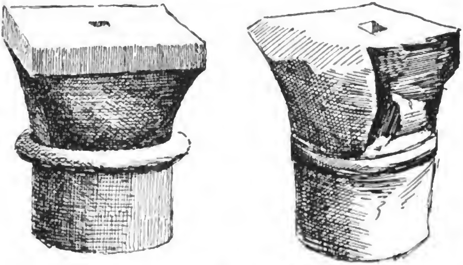

Fig. 50. Two Capitals.

The bases, of which there are fourteen, are circular without square plinths (fig. 51). They are all about 8¾ inches high, and consist of two torus mouldings, separated by a square sectioned recess instead of the usual scotia moulding of the Attic base. The outline sketch of fig. 51 gives the section of the mouldings drawn to scale. In two instances the torus mouldings of the base have each a nick cut in them. It is not possible to determine accurately from the surviving data the original height of the whole pillars; but it is not probable that base, shaft, and capital would exceed a total of 10 feet from the floor.

Two of the columns present a peculiarity calling for notice. They have each (fig. 52) a corbel wrought upon the face. The corbels are $12\frac{3}{4}$ inches high, and the top forms a flat shelf, which is 9 inches wide with a projection of $3\frac{1}{2}$ inches. Half an inch above the shelf there is a mortise-hole or pocket, $2\frac{1}{2}$ inches deep by $2\frac{1}{2}$ inches wide, cut into the shaft in such a way that its floor slopes downwards at an angle of about 45°. In the case of one of the shafts, the mortise-hole is broken away but the corbel remains. This contrivance is evidently a rest and catch for a timber strut to assist in supporting a lintel, the strut having had

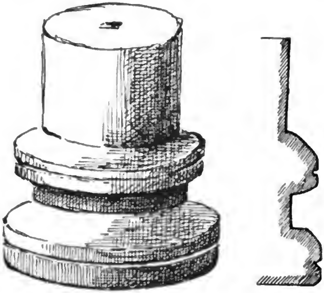

Fig. 51. Base of Pillar and Section.

a tenon to fit into the mortise-hole. The strut with tenon shown alongside the shaft, in fig. 52, will sufficiently explain what is meant. The circumstance that this feature occurs on only two of the shafts justifies us in inferring that the pillars of the cloister or verandah were not all equally spaced, but that one space was so much wider than any of the others that the connecting lintel required to be supported by struts. Probably this was a doorway leading from the front court of the Praetorium or Principia to the central space. It may be a further inference that there were timber lintels laid from pillar to pillar. On the other hand, this fort yielded several examples of the mortise-and-tenon principle being wrought out in stone.

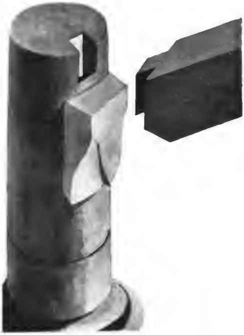

Fig. 52. Pillar with Corbel.

Another portion of a shaft, about 1 foot 9 inches high, has cut in it a square slot-hole, about 4½ inches long by 2½ broad and 2¾ deep. This is suggestive of a parapet railing from pillar to pillar. On still another short fragment of a column there is a round hole 1½ inches in diameter by 2¾ inches deep. All the shafts show very distinct chisel-marks running the long way of the stone. Over and above, some have rough, decided scores, which would appear to be intentional, although one cannot be quite certain upon this point. Most of these stones are broken off roughly at their ends, and within one foot or so of the top the larger ones taper considerably—the result, perhaps, of accident or of weathering.

The details of base, shaft, and column, as above described, are sufficient to establish a scale of architectural effort in our Scottish forts. It may be admitted that they are rude in treatment; but they are evidence of leisure, security of position, and intention to remain in occupation of buildings so adorned. The three architectural features illustrated are strictly classical. The bases have a rough resemblance to the Attic base; the columns are well wrought with a taper; the capitals are quite unlike Roman capitals, but rather remind us of eleventh or twelfth century work. In this last respect there is a very striking analogy in the use of the chevron.

As to the position occupied by the pillars there can be little or no doubt. They were connected with the verandah or cloister that ran round the entrance court of the Praetorium. This conclusion is made certain by what is known regarding the arrangement of the corresponding building elsewhere. At Birrens a row of six pillars separated the entrance court from the central space, while in the court itself there were found the base stones of a row of four timber pillars that had supported the verandah. At Housesteads, in 1898, there were discovered in the Praetorium the foundations of a row of six pillars in a position exactly similar to the six at Birrens, while pillars for supporting a verandah were proved to have run round three sides of the court.

Most of the stones of which we have been speaking, as well as most of the similar stones found in other forts, exhibit holes which are either mortise-holes for a dowel of metal, stone, or wood, or lewis-holes made for lifting the stones with a crane. The former explanation seems the more probable. The stones are not sufficiently heavy to demand the use of a crane, nor was their position so high above ground as to make one necessary. The holes often appear on the bases of the pillars, although these rested on the level of the floor. On the other hand, it is curious that no traces of dowels have ever been reported. It is worth noting that most of the capitals and bases have a portion of the shaft wrought in the same stone; the length of the portions varies greatly, the maximum being 12 or 14 inches. These upper and lower beds are all fairly perfect, unlike the ends of the shafts. The practice of cutting the capital and as much as a foot of the shaft out of a single stone entailed a waste, which can have been a matter of no consideration.

On contrasting these and other relics of actual Roman buildings in Scotland with the decorative representations of Roman architectural work which are found on altars, tablets, or monuments, one cannot but be struck with the widely divergent architectural styles which they exhibit, even although they are contemporary. As we have seen, the Bar Hill details are rude in execution and design, while at the same time they show a knowledge of the classic features of shaft, base, and capital. So strangely do they differ in size and in method of reaching their purpose that, had they not all been found together, it might have been supposed that they had belonged to different buildings. The capitals in themselves have no affinity with any of the Roman orders, although they are exactly of the same type as those developed in Western Europe some centuries later. Further, we have noted in the mortise-pockets an indication that the pillars were not connected with arches but with lintels, and these probably of wood. Had they been of stone, they would have had the same chance of being preserved as had the shafts. Had arches been used, some of the voussoirs would surely have survived. One can hardly suppose that these shafts and capitals had supported a regularly designed classic entablature and cornice of stone, or even a wooden imitation of these. Probably there was only a simple beam.

On the other hand, if we turn to the architectural representations on single monuments, such as the tablet from the Antonine Vallum[1] illustrated in fig. 53, we are surprised at the marked difference of style and workmanship. We can see that the tablet must have been designed and executed by some one who was perfectly familiar with contemporary Roman architecture. Its fluted and beaded pilasters, with the Attic base and Corinthian capital, are quite after the Roman manner, and the same may be said of cornice and pediment. The reclining figure holding the laurel wreath is likewise the work of a competent artist. Again, the altar in the National Museum, from the Well at Birrens (fig. 54), has

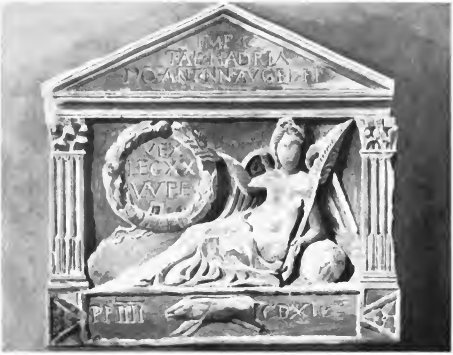

Fig. 53. Tablet from Chapel Hill on the Antonine Vallum.

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[1] Figured in Plate i., fig. 1, of *The Roman Stones in the Hunterian Museum, Glasgow*, by James Macdonald, LL.D., 1897.

on the front of its capital a representation of a round arched gateway, the architectural features of which combine the characters of both the above schools. It has an archivolt giving all the effect of a double facia, and the circular alcove is decorated with the radiating shell ornament so characteristic of Roman work. The ingoing of the gateway has a round, baluster-shaped column, reminiscent of the style of a long subsequent period. This does not carry the archivolt, which is supported by a moulding, thus revealing the work of an unskilled hand. The surbase of the wall is ornamented on each side of the gateway with three tiers of decoration, closely resembling eleventh or twelfth century

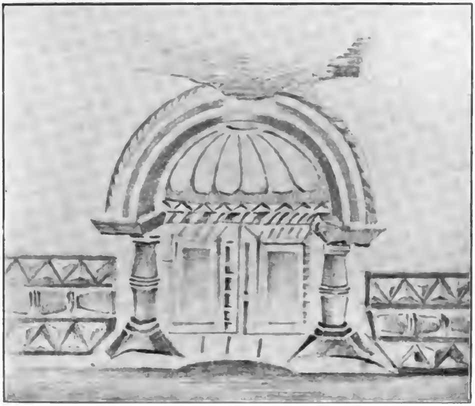

Fig. 54. Arched Gateway, on Altar from Birrens.

work. The general conclusion—a conclusion applicable to sculpture as well as to architecture—would seem to be that, in North Britain in Roman times, there were competent artists busy, men acquainted with the style of Southern art, but that much of the execution was left in untrained hands. The remarkable thing is that these untrained artists carried out the work along lines which (one may say) perished with them, only to be revived centuries later in Christian times.

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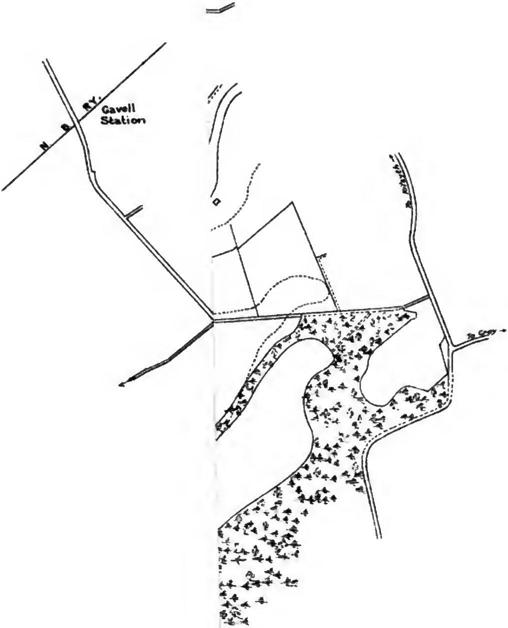

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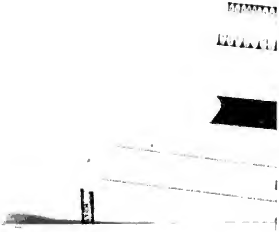

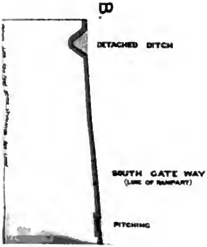
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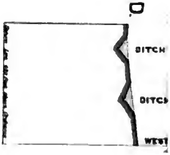
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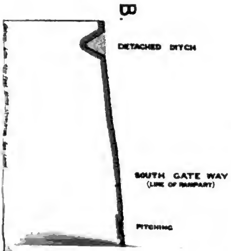
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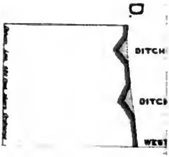
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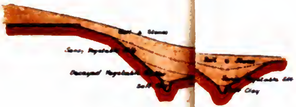

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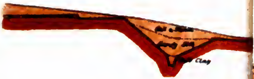

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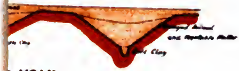

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